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# Final Programmatic Environmental Impact Statement for the Kiowa, Rita Blanca, Black Kettle, and McClellan Creek National Grasslands Land and Resource Management Plan

## Cibola National Forest and National Grasslands

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# Final Programmatic Environmental Impact Statement for the Kiowa, Rita Blanca, Black Kettle, and McClellan Creek National Grasslands Land and Resource Management Plan

## Mora, Harding, Union, and Colfax Counties, New Mexico; Dallam, Hemphill, and Gray Counties, Texas; and Cimarron and Roger Mills Counties, Oklahoma


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**Abstract:** The Cibola National Forest and National Grasslands proposes to revise those parts of the 1985 "Cibola National Forest Land and Resource Management Plan" specific to future management of the Kiowa, Rita Blanca, Black Kettle, and McClellan Creek National Grasslands. The revision would take the form of a new plan for the Grasslands that would be separate and discrete from the 1985 Cibola National Forest plan. The final programmatic environmental impact statement discusses three alternatives in detail, the no action alternative (alternative A) which is the 1985 plan; the preferred alternative (alternative B), which would be a new plan for the Kiowa, Rita Blanca, Black Kettle, and McClellan Creek National Grasslands; and the Canadian River Potential Wilderness Area alternative (alternative C), which would be similar to alternative B but with recommendation for a wilderness area designation. The preferred alternative would address foreseeable issues that may arise during the next 15 years, based on needs for change identified from the 1985 plan; provide for clear direction in the form of desired conditions, objectives, standards, and guidelines, suitability, and monitoring; incorporate up-to-

date best available science and adaptive management strategies; and establish discrete management areas. The Forest Service considered other alternatives but determined that they would not meet the needs for change from the 1985 plan, were not feasible, or failed to meet established Forest Service Manual (FSM) or Handbook direction.

# Summary

The Cibola National Forest (NF) and National Grasslands (NGs) proposes to implement a new land and resource management plan for the Kiowa and Rita Blanca (KRB) and Black Kettle and McClellan Creek (BKMC) NGs. The area affected by the proposal includes the: Kiowa NG, which covers 137,537 acres and is located within Mora, Harding, Union, and Colfax Counties, NM; Rita Blanca NG, which covers 92,989 acres and is located within Dallam County, TX, and Cimarron County, OK; Black Kettle NG, which covers 31,286 acres and is located within Roger Mills County, OK, and Hemphill County, TX; and McClellan Creek NG, which covers 1,449 acres in Gray County, TX. This action is needed because the National Forest Management Act of 1976 requires land and resource management plans (LRMPs) be revised every 10 to 15 years, and the current management direction for the Grasslands under the 1985 Cibola National Forest LRMP now exceeds 25 years.

Extensive public involvement and collaboration related to developing the plan for the KRB and BKMC NGs (herein collectively referred to as the "Grasslands") has occurred and is ongoing. Informal discussions with the public regarding needed changes to the 1985 plan began with a series of public meetings in 2006. This input, along with science based evaluations, were used to determine the needs for change. Additional meetings, correspondence, news releases, comment periods, Federal Register notices, Web postings, and other tools have been utilized to date to gather feedback from the public, Cibola National Forest and NGs employees, tribal governments, Federal and state agencies, and local governments. The draft Grasslands LRMP proposed as alternative B is a culmination of these public involvement efforts.

## History

With the authorization of the Homestead Act in 1862, European settlement of the prairies took hold. During the following decades—through the 1920s—settlers could homestead a quarter section (160 acres) of unclaimed land. They established intensive wheat and row-crop agriculture, including cattle ranching, during a period of unusually wet weather. Beginning in the early 1930s, the region experienced severe drought, and strong winds swept across the exposed soils, removing as much as 4 inches of organic matter, clay, and silt, creating conditions that have come to be known as the Dust Bowl. With the farms ruined, thousands of families migrated westward, leaving vast tracts of land abandoned. In 1937, at the height of the Depression, Congress authorized the Bankhead Jones Farm Tenant Act requiring the Department of Agriculture to develop a program of land conservation and utilization.

In subsequent years, the USDA Soil Conservation Service purchased abandoned lands and initiated a number of projects intended to stabilize environmental conditions. Thus, over time the 160-acre parcels were assembled for reclamation. Some parcels collectively formed small contiguous units, but many remain dispersed and reflect the fragmented ownership pattern seen today. In 1960, with the establishment of the NGs, responsibility for administration of the Bankhead Jones Act was transferred to the U.S. Forest Service.

This region of the country is predominantly rural and has an economic base consisting largely of agricultural industries.

# Alternatives

## Alternative A, No Action

Alternative A would recommend the continuance of the 1985 Cibola National Forest LRMP (as amended) for the Grasslands for the next 15 years. Alternative A is more fully described in Chapter 2. Several issues led the Agency to develop alternatives to alternative A:

- The age of the current plan, the lack of detail relevant to management of the Grasslands, and silence on emerging issues (wind energy, climate change, invasive species) affecting the Grasslands.
- The often evident ambiguity of the stated management direction of the current plan with the actual, science-based, adaptive management currently occurring on the Grasslands.
- The desire by some members of the public to have the Regional Forester propose to Congress the designation of a portion of the Canadian River Inventoried Roadless Area on the Kiowa NG as a wilderness area, a suggestion opposed by others.

## Alternative B, the Proposed Plan

Alternative B would define and emphasize management of vegetation and habitat to move toward desired vegetation structure and species composition, would incorporate research and potential strategies for addressing effects of climate change, would address invasive species control on the Grasslands, would provide direction for wind energy development, and would remove redundancy with law, regulation, and policy. Alternative B would also provide more direction for conservation of habitats associated with species at risk and would provide more and clearer direction to management of recreation, scenery and other activities and resources than alternative A. Finally, alternative B would more clearly articulate the application of adaptive management and would bring more current science to all management direction.

## Alternative C, the Canadian River Potential Wilderness Area Alternative

Recommendation would be made to designate a portion of the Kiowa NG Canadian River Inventoried Roadless Area (IRA) as the Canadian River Potential Wilderness area. Specific plan components for a wilderness area designation would be developed. Management within the potential wilderness area would be governed by Wilderness Act regulations as described in FSM 2320. All other management direction in alternative C would be identical to that of alternative B.

# Decision to be Made

Based upon the potential outcomes of the alternatives, the responsible official will decide whether to implement the preferred alternative as described above, to vary the design of the proposed draft plan to meet the purpose and need through some other combination of management direction, or to take no action at this time.

## Environmental Outcomes

Chapter 3 of the final programmatic environmental impact statement presents the affected environment and the analysis of potential outcomes. Following is a summary of the potential impacts, by resource area, predicted to result from implementation of alternatives A, B, or C.

### Vegetation Types, Wildlife, and Habitat

Common to all alternatives, areal extent of early successional stage shortgrass prairie would increase from the expansion of black-tailed prairie dog (BTPD) colonies, benefiting Mountain Plover, swift fox, and the Burrowing Owl (a management indicator species (MIS)).

All alternatives would have similar impacts on threatened, endangered, candidate, and proposed species and selected MIS—Burrowing Owl, Mountain Bluebird, and Rio Grande Turkey.

Alternative A would have vague and confusing language that often would not reflect current management, which is based upon best available science and adaptive management.

Alternative A would provide direction for controlling and reducing areal extent of shinnery oak versus alternatives B and C which would encourage expansion of the shinnery oak vegetation type for ground-nesting birds.

Alternative A addresses controlling BTPD colonies. With the addition of BTPDs to the Regional Forester's Grassland sensitive species list in 2007, the alternative A controls were superseded by conservation measures that allow BTPD colony expansion with outcomes similar to alternatives B and C.

Alternatives B and C would move all vegetation types toward desired vegetation structure and species composition and would be resilient to the stressors of climate change such as drought, long-term increases in precipitation, and higher annual average temperatures. Alternative A would not have predictable outcomes in regard to vegetation structure and species composition.

Under alternatives B and C, undesirable native invasive trees such as eastern redcedar and black locust and undesirable nonnative invasive Siberian elm and saltcedar would be removed in the shinnery oak and mixed-grass and cottonwood-willow riparian vegetation types. Although alternative A would allow removal of noxious or exotic invasive plants, there would be no focus on removing undesirable native invasive trees in these vegetation types.

Alternatives B and C would reduce encroachment of eastern redcedar in the understory of mixed hardwood riparian, attaining a diversity of structural stages habitat for the Rio Grande Turkey (a MIS).

Alternative B and C would attain a diversity of structural stages and composition in pinyon-juniper habitat for cavity-nesting birds such as the Mountain Bluebird (a MIS).

### Viability High At-Risk Species

Common to all alternatives, areal extent of early successional stage shortgrass prairie would increase from the expansion of BTPD colonies, benefiting Mountain Plover and swift fox.

Alternatives B and C would conserve and maintain habitat for species determined to have high at-risk viability concerns, by moving vegetation types toward desired vegetation structure and species composition, benefiting all viability high at-risk species. Alternative A would not provide predictable trends on the conservation of habitat.

Under alternatives B and C, undesirable native invasive trees such as eastern redcedar and black locust and undesirable nonnative invasive Siberian elm would be removed in the shinnery oak and mixed-grass vegetation types, benefiting Lesser Prairie-chicken. Although alternative A would allow removal of invasive plants, there would be no focus on removing undesirable trees in these vegetation types.

Alternatives B and C would attain a diverse mix of native grasses and forbs adapted to moisture regime fluctuations in the herbaceous portion of riparian areas. Meander scars and depressions in the riparian areas would retain water for part or all of the year and provide habitat for amphibian species such as the plains leopard frog. Alternative A would provide an unpredictable state of vegetative structure and composition and associated habitats.

## Soils and Water

Under all alternatives, soil erosion would be reduced by maintaining adequate vegetative cover of areas grazed by livestock and by rehabilitating defunct oil and gas drilling pads and associated roads. Existing BTPD colonies would remain susceptible to soil erosion.

Under all alternatives, hydrologic function would be improved by removal of saltcedar and restoration of native species. Alternatives B and C would improve stream connectivity and structural components of channels and riparian areas; alternative A provides less direction to do so.

## Invasive Species

The outcome for all alternatives is similar. Invasive and noxious plants and animals would be identified and removed on a timely basis, limiting their potential spread.

Alternative A would maintain and sustain shelterbelts, thus supplying a source for undesirable native and nonnative invasive tree seed from species such as black locust, eastern redcedar, and Siberian elm. Alternatives B and C would reduce the areal extent of undesirable trees and would provide clear management direction for effective noxious/invasive plant species control which would provide more benefit to wildlife habitat. Although alternative A would allow removal of nonnative invasive plants, there would be no focus on removing undesirable native invasive trees.

Alternatives B and C would more clearly address controlling invasive animals, such as feral hogs, than would alternative A, but alternative A and other established Forest Service direction allow for similar control activities.

## Recreation, Scenery, and Nature-Based Tourism

Alternative A would lack management direction specific to BKMC NGs and KRB NGs for dispersed recreation, other than motorized use. It would emphasize the construction and reconstruction of developed camping and picnic sites to maximize capacity use. Alternatives B and C would place more emphasis on dispersed uses such as hunting, fishing, hiking, and

interpretive site development rather than increasing capacity at developed camping and picnic areas.

Recreation Opportunity System (ROS) classes defined in alternative A are limited to roaded natural and semiprimitive motorized and would not adequately reflect the actual outdoor recreation settings on the Grasslands. The ROS classes defined under alternatives B and C would include two additional classes, semiprimitive nonmotorized (SPNM) and rural to better characterize the conditions (setting and facilities) for dispersed, motorized, and developed opportunities. Alternative B would create a new management area in Mills Canyon classified for the most part as SPNM. This ROS classification would restrict motorized uses in the area.

Alternatives B and C would provide higher standards for scenery management than alternative A. Alternatives B and C would provide more direction and protections for scenic resources especially around developed recreation sites, heritage sites, and areas of high scenic integrity than alternative A.

Alternative A would not give guidance on nature-based tourism. Alternatives B and C would emphasize interpretive sites and partnerships with state and Federal agencies and nongovernmental organizations to encourage nature-based tourism.

## Heritage Resources

Alternatives A, B, and C would call for proactive preservation, interpretation, and monitoring measures in cooperation with other agencies and according to law, regulation, and policy. Alternatives B and C also specify Grasslands-wide preservation projects, public outreach, interpretation, and a site steward program.

## Special Areas and Eligible Scenic River

Alternative A would be silent on the scenic byways and the Santa Fe National Historic Trail. Alternatives B and C would provide protections for the unique characteristics of these areas and encourage partnerships with state and Federal agencies to develop and promote tourism. Alternative A would provide protections for the Canadian River eligible scenic river corridor through amendment 10 (of the 1985 Cibola Forest Plan). Protections afforded by amendment 10 would be carried forward into alternatives B and C.

## Wilderness

Alternative C would recommend the Canadian River Potential Wilderness Area (PWA) for designation, alternatives A and B would not. Under alternative B, management direction for the proposed Mills Canyon Management Area would conserve many of the same wilderness-like features that alternative C would.

## Roads, Access, and Land Adjustment

There are no substantial differences among the alternatives for roads, access, or land adjustment.

## Minerals, Energy Development, and Special Uses

Under all alternatives, defunct oil and gas drilling pads and associated roads would be rehabilitated. While none of the alternatives would prohibit energy development, alternatives B and C would provide stronger protections for the environment and scenery than alternative A.

## Special Forest Products

Special forest products include traditional wood products such as post, poles, and firewood, but also include pinyon nuts, mushrooms, and flowering plants. Under all alternatives, pinyon-juniper forest products would be available to the public. Under alternative C, removal of some forest products could be prohibited in the potential wilderness area. Alternatives B and C would remove undesirable, invasive trees, providing more forest products overall than under alternative A.

## Wind Energy Development

Alternatives B and C would restrict wind energy development within one-half mile of developed recreation sites. Wind energy development could also be restricted on a site-specific basis due to wildlife and heritage concerns. All alternatives would be subject to Forest Service directives on wind energy siting, development, and monitoring.

## Livestock Use

Under all alternatives, BTPDs may reduce available forage for livestock. Under alternative A, available forage would increase, as 4,400 acres of shinnery oak would be converted to grassland. This alternative would have the Grasslands develop miles of fence and water pipeline, and numerous watering facilities that are not needed and would be expensive. Alternatives B and C would not require these developments.

## Wildland-Urban Interface and Fire Management

There are no major differences among the alternatives regarding the wildland-urban interface and fire management. Under all alternatives, wildland fire-caused damage would be reduced on the Grasslands through fuels management on the Grasslands and adjacent private land.

## Socioeconomics

Impacts resulting from implementation of any alternative would not generate a noticeable effect on economic conditions overall. The slight difference in present net value (PNV) between alternatives A, B, and C is due to costs associated with ecosystem restoration projects. With regard to alternative C, designated wilderness could alter recreational patterns, which in turn could affect economic activity from changes in recreation uses. While overall annual visitation will likely remain the same, the distribution of recreation activities would change. The consequence would likely be more social than economic.

### Environmental Justice

It is unlikely that there would be a disproportionate adverse effect on minority or low-income populations from implementing any of the alternatives. In cases where management decisions would create jobs and boost the local economy, these populations may directly benefit.

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# Chapter 1. Needs for Change

## Document Structure

The Forest Service has prepared this final programmatic environmental impact statement (FPEIS) in compliance with the National Environmental Policy Act (NEPA) and other relevant Federal and state laws and regulations. This FPEIS discloses the direct, indirect, and cumulative environmental impacts that would result from the preferred alternative and other alternatives. The document is organized into four chapters and an appendix:

- *Chapter 1. Needs for Change*. The chapter includes information on the history of the plan proposal, the needs for change identified in the analysis of the management situation (see the Web address provided in appendix B), and the Agency's proposed plan to address those needs for change. This section also details how the Forest Service informed the public of the proposed plan and how the public responded.
- *Chapter 2. Alternatives, Including the Proposed Plan*. This chapter provides a more detailed description of the Agency's proposed plan as well as alternative methods for achieving the stated purpose. These alternatives were developed based on significant issues raised by the public and other agencies. Finally, this section provides a summary table of the environmental consequences associated with each alternative considered in detail.
- *Chapter 3. Affected Environment and Environmental Consequences.* This chapter describes the environmental consequences of implementing the proposed plan and other alternatives considered in detail. This analysis is organized by needs for change topic: (1) Ecosystem Diversity, (2) Managed Recreation, and (3) Human Influences on the Grasslands.
- *Chapter 4. Consultation and Coordination.* This chapter provides a list of preparers and agencies consulted during development of the environmental impact statement.
- *Appendix*. The appendix consists of numerous parts and provides more detailed information to support the analyses presented in the programmatic environmental impact statement.

Additional documentation, including more detailed analyses, may be found in the planning record located at the Cibola National Forest Supervisor's Office, 2113 Osuna Road, NE, Albuquerque, New Mexico 87113.

## Background

The Kiowa (K), Rita Blanca (RB), Black Kettle (BK), and McClellan Creek (MC) National Grasslands (herein collectively referred to as the "Grasslands") have been under Federal ownership since the late 1930s and are currently administered by the Cibola National Forest (NF) and National Grasslands (NGs) Supervisor's Office located in Albuquerque, NM. The Kiowa NG covers 137,537 acres and is located within Mora, Harding, Union, and Colfax Counties, NM. The Rita Blanca NG covers 92,989 acres and is located within Dallam County, TX, and Cimarron County, OK. The district ranger office for both the Kiowa and Rita Blanca (KRB) NGs is located in Clayton, NM. The Black Kettle NG covers 31,286 acres and is located within Roger Mills County, OK, and Gray and Hemphill Counties, TX. The McClellan Creek NG covers 1,449 acres and is also located in Gray County, TX. The district ranger office for both the BK and MC (BKMC) NGs is located in Cheyenne, OK. The Kiowa NG resides in the Third Congressional

District of New Mexico, the Rita Blanca and Black Kettle in the 13th Congressional District of Texas and the Third Congressional District of Oklahoma, and the McClellan Creek NG in the 13th Congressional District of Texas (figure 1).

**Figure 1. Vicinity map of the Kiowa, Rita Blanca, Black Kettle, and McClellan Creek National Grasslands**

According to the National Forest Management Act of 1976 (NFMA), land and resource management plans are to be revised on a 10- to 15-year cycle. Management of the Grasslands has been directed from 1985 to the date of this document by the 1985 "Cibola National Forest Land and Resource Management Plan" (LRMP), as amended, which combines the management direction for the Grasslands with that for the forested, mountain districts of the Cibola NF (herein referred to as the "Forest"). Upon signing by the regional forester of the record of decision (ROD) for this new LRMP (herein referred to as the "plan") for the Grasslands, this new plan will replace the direction provided by the 1985 plan for all of the national grasslands named above.

The Grasslands have many roles and make many contributions to the local cultures, economies, and landscapes. For example, the Grasslands contribute to the sustainability of diverse southern Great Plains grassland ecosystems and associated wildlife. The Grasslands demonstrate successful ecosystem restoration of lands that were degraded during the Dust Bowl era. Grasslands management contributes to the sustainability of productive soils, high quality water and riparian resources, and native prairie habitat and species. The Grasslands also include the shinnery oak vegetation type that is underrepresented on a landscape scale. The public values

how Grasslands management demonstrates the coexistence of complementary land uses such as cattle grazing, hunting, and oil and gas production without compromising the ecological integrity of the Grasslands habitat.

Recreational opportunities on the Grasslands greatly contribute to the quality of life enjoyed by visitors. The Grasslands provide outstanding opportunities for dispersed recreation opportunities such as hunting, fishing, camping, hiking, viewing birds and other wildlife, driving to enjoy the scenery and open spaces, and visiting historic sites. The developed recreation sites—particularly the lake-based recreation complexes on the BKMC NGs and the developed sites in the Mills Canyon area—offer unique and significant features available for visitors to enjoy within this region. Outdoor recreational activities on the Grasslands are very important to the local tourism economy, in 2002 generating 75 jobs, $1.2 million in direct income, and $3 million in indirect income for local businesses (UNM-BBER 2005).

Livestock grazing on the Grasslands contributes to maintaining the ranching culture and lifestyle of these rural areas, improves the fiscal sustainability of local ranching operations, and contributes to historical disturbance processes. Over 96 percent of the Grassland units are used by permit holders to graze their cattle. This use of the Grasslands contributes to the social and economic well-being of this area while sustaining native prairie ecosystems. In 2002, livestock grazing on the Grasslands generated 106 jobs, $1.6 million indirect income, and $10 million on the final value of products from the industry (UNM-BBER 2005).

The Grasslands provide opportunities for oil and natural gas extraction that contribute to meeting the Nation’s energy needs. The Grasslands may also play an important future role for alternative energy developments such as wind. In 2002, gas and oil extraction generated 79 jobs, $3.5 million in direct income, and $11 million on the final value of products from the industry (UNM-BBER 2005).

The Grasslands contain significant scenic, heritage (historic and prehistoric), and paleontological (fossil) resources. These offer opportunities for the public to learn about the past and appreciate the resources and beauty of the Grasslands. These important resources provide opportunities to base tourism businesses on bird watching, hunting, wildlife viewing, and visiting historic and cultural sites.

The Grasslands provide opportunities for research and discovery on the roles of fire and herbivory in the Grasslands’ vegetation types and wildlife interactions. Other ongoing research activities include seismic/earthquake monitoring on the Great Plains and monitoring of aquifers.

Three features on the Grasslands are formally designated as “special areas” to highlight and preserve their unique historic and scenic characteristics. These special areas include the Santa Fe National Historic Trail and two scenic byways—the Santa Fe Trail National Scenic Byway and La Frontera del Llano Scenic Byway (state). Other areas of interest include the Canadian River Inventoried Roadless Area (IRA) and the Canadian River eligible scenic river corridor which attracts visitors with its remarkable historic, geologic, and scenic features, and recreational opportunities.

The Forest Service plays a cooperating role in working with volunteer rural fire departments and others by contributing Federal firefighting resources to help protect valuable natural resources along with private properties and communities.

## Needs for Change

The NFMA directs that plans be revised on a 10- to 15-year cycle. The 1985 plan is 26 years old as of 2011. Since 1985, there have been changes in economic, social, and ecological conditions; new policies and priorities; and new information generated by scientific research.

Another fundamental need for change is that the 1985 plan does not address many of the unique Grasslands features, as it was developed primarily for the mountain districts of the Cibola NF.

Extensive public, intra-agency, and interagency collaborations, along with science-based evaluations, identified the needs for change to the 1985 plan. The needs for change are organized into three topics that focus on the sustainability of ecological, social, and economic systems: (1) Ecosystem Diversity, (2) Managed Recreation, and (3) Human Influences on the National Grasslands.

### Needs for Change Topic 1: Ecosystem Diversity

Since the 1985 plan was implemented, ecological monitoring and new scientific information have advanced the Agency's knowledge and understanding of vegetation and its range of historical variation, ecological processes, and habitat requirements of native fauna. Similarly, new issues have emerged including the introduction of nonnative plants and changes in climate. Specific management direction is needed for the following:

- To move vegetation types toward desired vegetation structure and species composition
- To address the unwelcome introduction and spread of invasive plants
- To anticipate and respond to changes in climate, relative to NGs management

### Needs for Change Topic 2: Managed Recreation

The 1985 plan does not specifically address issues related to recreation and scenic resources that support social and economic sustainability on the NGs. The new plan would provide direction that is specific to the Grasslands, relative to management of motorized, dispersed, and developed recreation opportunities, areas of high scenic integrity, and possible designation of special areas. Specific management direction is needed for the following:

- To manage for recreation opportunities in a variety of settings from highly developed settings with amenities provided for visitor comfort and convenience, to less developed settings with few to no amenities.
- To manage scenic resources based upon objectives for management activities and specific areas, particularly those with high scenic integrity.
- To address opportunities for visiting sites, such as the eligible scenic Canadian River, and interpretive activities related to unique scenery, historic/cultural sites, and wildlife.
- To provide special area assessments and recommendations for potential wilderness, eligible scenic rivers, and/or research natural areas.

## Needs for Change Topic 3: Human Influences on the National Grasslands

The 1985 plan does not provide adequate Grasslands-specific direction regarding the management and monitoring of livestock grazing (this issue has been largely addressed by subsequent NEPA decisions); the placement, maintenance or rehabilitation of energy development sites; the use of planned fire or response to unplanned fire; and the allowance of special uses such as mineral extraction, utility corridors, firewood harvesting, and research activities. Specific management direction is needed for the following:

- To incorporate adaptive management toward ecosystem-based desired conditions within the livestock grazing program.
- To address and guide wind energy development while protecting natural resources, heritage sites, and scenery.
- To rehabilitate disturbed sites such as roads and oil and gas pads, and to protect soil productivity and reestablish vegetative cover.
- To provide direction to the process for obtaining legal road access that meets public, private landowner, and management needs.
- To permit utility easements and related special uses.
- To provide direction for the removal of miscellaneous forest products such as plants, grass seed, and other materials.
- To provide direction for the noncommercial use of common mineral materials.
- To provide direction on firewood and firewood harvesting and gathering on the NGs.
- To provide direction on opportunities to conduct research regardless of whether or not a research natural area is established.
- To provide direction for responding to wildland fires and the use of prescribed fire in areas with fragmented ownership such as the Grasslands.
- To provide direction for the stabilization and preservation of historic structures and traditional cultural properties.
- To address the role of heritage sites, such as the Santa Fe National Historic Trail, in rural economic development.

These needs for change are described more fully through an analysis of the management situation (AMS), which is comprised of the comprehensive evaluation report (CER) and Kiowa, Rita Blanca, Black Kettle, and McClellan Creek National Grasslands CER supplementary document to meet AMS requirements and associated evaluations—the “Socioeconomic Sustainability Report” (SESR), “Ecological Sustainability Report” (ESR), and “Kiowa National Grassland Wilderness Evaluation Report” (All AMS documents are included in appendix B, including the “Kiowa National Grassland Wilderness Evaluation Report.” These documents are part of the planning record and are available on the Cibola NF Web site).

## Proposed Plan

The Forest Service proposes to develop a new, Grasslands-specific LRMP that responds to the needs for change identified above. It will provide strategic, program-level guidance for management of the Grasslands, including its natural resources and uses, over the next 10 to 15 years. For each needs for change topic, the Grasslands plan revision team, in collaboration with the public and other agencies, developed a vision of the future for the Grasslands that does the following:

- Provides the basis for future site specific, project-level decisions that will be made based on additional detailed environmental impact analyses and additional public involvement.
- Provides a context for future, project-level planning.
- Identifies strategies to maintain or achieve goals and desired conditions over time.
- Identifies land areas as generally suitable or unsuitable for various uses.
- Identifies standards and guidelines to guide the planning of projects and activities.
- Identifies areas with special or unique characteristics.
- Provides monitoring and evaluation requirements.
- Emphasizes the use of best available science and adaptive management.

Specific details about the proposed plan are provided in chapter 2.

## Decision Framework

The regional forester for the Southwestern Region will make the final decision on the revised Grasslands plan. In order to do so, the regional forester will review the proposed plan, the other plan alternatives, and the environmental consequences to decide which Grasslands plan alternative best meets the following needs:

- Achieving quality land management under the sustainable, multiple-use concept.
- Meets the diverse needs of people.
- Conserves the Grasslands' resources as required by the NFMA and the Multiple Use-Sustained Yield Act.

Upon signing by the regional forester of the ROD for this new Grasslands LRMP, this new plan will replace the direction for the Grasslands formerly provided by the 1985 plan.

## Public Involvement

Forest planning occurs within the overall framework provided by the implementation regulations of the NFMA and NEPA. Public involvement is a key component in the forest plan revision process under these regulations. Extensive public involvement and collaboration related to revising the Grasslands plan has occurred and is ongoing and is more fully described in appendix I.

Informal discussions with the public regarding needed changes to the 1985 plan began with a series of public meetings in 2006. This input, along with science-based evaluations, was used to determine the needs for change. Additional meetings, correspondence, news releases, comment periods, Web postings, and other tools have been utilized to gather feedback from the public, Cibola NF employees, tribal governments, Federal and state agencies, and local governments. In September 2008, three reports (ESR, SESR, CER) were released by the Cibola NF that identified the needs for change relative to existing conditions on the Grasslands and the existing (1985) forest plan management direction pertinent to the Grasslands. The availability of these reports was reported in the Federal Register on September 19, 2008, the reports were posted on the Cibola NF Web site, and hardcopies were offered upon request. In March 2009, a series of public meetings was held on the Grasslands to solicit input and comment on potential desired conditions for the ecological, social, and economic goods and services produced by the Grasslands. These potential desired conditions had been developed based upon previous collaborations as described above that had identified needs for change from the current plan. Responses and inputs resulting from these focus group meetings further refined the desired conditions of the draft plan. The Cibola NF planning staff proceeded to draft objectives, guidelines, standards, suitability designations, and monitoring elements that would achieve the desired conditions. An AMS supplemental document to the CER was published by the Forest in January 2010 to meet requirements of the 1982 Planning Rule Provisions after the 2008 Planning Rule was enjoined. The AMS supplemental document brought forth updated information, such as benchmark analyses—the minimum and maximum levels of physical and biological production potentials within which all alternatives considered in detail should fall. This information was not included in the original CER of 2008.

On January 15, 2010, the Forest Service initiated the formal scoping process by publishing the notice of intent (NOI) to prepare an EIS and a revised LRMP for the NGs (Vol. 75, No. 10, 2477-2480). The NOI described the change needed for the 1985 forest plan and invited the public to comment on the proposal to revise the plan. The public was asked to provide comments by February 15, 2010, to be most useful, but comments were accepted and considered regardless of arrival date. A working draft Grasslands plan developed by Forest planning staff subsequent to the focus group meetings was made publically available on March 9, 2010, and scoping comments on alternatives to the working draft plan were requested to be submitted by May 15, 2010. In April 2010, as part of the public involvement process, the Forest Service held a series of five public meetings on the Grasslands to invite review and comment on the working draft of the proposed plan and to help refine and further develop the plan components. During this collaborative phase of plan development, the working draft plan became a “rolling alternative.” [1] (See appendix I for dates and locations of the scoping meetings.)

Comments received from the NOI, public meetings, mailings, and Web postings were analyzed to determine public issues and concerns. Sixty-five separate, but interrelated issues were identified from the AMS, the NOI, and public comments. Of these, the issues that were within the Forest Service’s legal authority to address, and not in conflict with established Forest Service Manual (FSM) or Handbook (FSH) direction, were evaluated and either incorporated into the rolling

[1] A rolling alternative starts with a proposed action or alternative, incorporates new information from public comments or internal analysis, and ultimately changes the original alternative and documents how the alternative has been modified.

alternative draft plan, or crafted into other alternatives to be considered and evaluated during the EIS analysis.

## Applicable Planning Rule

Preparation of the new plan was underway when the 2008 National Forest System (NFS) Land Management Planning Rule was enjoined on June 30, 2009, by the United States District Court for the Northern District of California (Citizens for Better Forestry v. United States Department of Agriculture, 632 F. Supp. 2d 968 (N.D. Cal. June 30, 2009)). On December 18, 2009, the department reinstated the previous planning rule, commonly known as the 2000 Planning Rule in the Federal Register (Federal Register, Volume 74, No. 242, Friday, December 18, 2009, pages 67059 through 67075). The transition provisions, 36 CFR 219.17(b)(3) of the 2012 Planning Rule (Vol. 77, No. 68, April 9, 2012) allow use of the provisions of the planning rule, commonly called the 1982 Planning Rule to amend or revise plans. The Cibola NF has elected to use the provisions of the 1982 Planning Rule, including the requirement to prepare an EIS, to complete its plan revision.

Although the 2008 Planning Rule is no longer in effect, information gathered prior to the court's injunction is useful for completing the plan revision using the provisions of the 1982 Planning Rule. The Cibola NF concluded that the information and collaborations developed during the plan revision process prior to the 2008 rule enjoinment were appropriate for continued use in the revision process. The information/evaluations conducted under the 2008 Planning Rule were supplemented in order to conform to the provisions of the 1982 Planning Rule.

In addition to the documents already named, the following documents were brought forward under the 1982 Planning Rule Provisions as part of the plan set of documents:

- The Kiowa National Grassland Wilderness Evaluation Report (see the Web address provided in appendix B of this FPEIS)
- USDA FS, Southwestern Region, Mid-Scale Vegetation Analysis (an inventory of current vegetation conditions), June 2009 (BKMC NGs), November 2009 (KRB NGs)
- USDA FS, Southwestern Region, Potential Natural Vegetation Types, 2008, which is a model simulation of vegetation inventory pre-European settlement, and which functions as the reference condition for current analysis
- Kiowa and Rita Blanca National Grasslands Geographic Area Assessments (USDA Forest Service 1999)
- Black Kettle and McClellan Creek National Grasslands Geographic Area Assessments (USDA Forest Service 2000)

# Chapter 2. Alternatives, Including the Proposed Plan

## Introduction

This chapter describes and compares the alternatives considered for the Grasslands LRMP. It includes a description of each alternative considered. This section also presents the alternatives in comparative form, defining the differences between each alternative and providing a clear basis for choice among options by the decision maker and the public. The information used to compare the alternatives is based upon environmental, social, and economic outcomes of implementing each alternative.

The 1982 Planning Rule Provisions at 219.12(f)(6) require forest plans to respond to and incorporate the Renewable Resource Planning Act (RPA) Program objectives for each national forest as displayed in regional guides. There is no longer a regional guide for the Southwestern Region. This was withdrawn as required by the 2000 Planning Rule Section 219.35(e). The last RPA Program was developed in 1995. In lieu of the RPA Program, the Forest Service Strategic Plan 2007-2012 provides broad overarching national guidance for forest planning and national objectives for the Agency as required by the Government Performance Results Act. All of the alternatives in this FPEIS address these broad strategic objectives.

The alternatives discussed below include management direction for the one IRA on the Grasslands as identified in the 2001 Roadless Area Conservation Rule (RACR). There is currently a legal dispute regarding the status of the RACR, with two Federal courts having issued conflicting rulings. Pending resolution of that legal question, the preferred alternative includes management area (MA) direction that retains the undeveloped character of this area. The decision for the final plan will be consistent with the legal status of the RACR at the time the plan is signed.

## Alternatives Considered in Detail

The Forest Service developed three alternatives—the no action alternative (A), the proposed plan alternative (B), and the Canadian River Potential Wilderness Area alternative (C). Alternative A is the 1985 Cibola National Forest LRMP (as amended). Alternative B is the rolling alternative, meaning it underwent continuous adjustment during its development. Alternative C is identical to alternative B except for the Canadian River potential wilderness area recommendation.

Alternative A, the 1985 plan which is in effect at this time, is silent on many contemporary issues such as invasive species, adaptive management of livestock, climate change, and wind energy development. However, alternative A would not prohibit management activities addressing these issues. Further, NEPA decisions that have occurred since 1985, in conjunction with national and regional FS directives established as policy since 1985, provide direction to Grasslands managers that is not explicitly stated within the language of the 1985 plan. Similarly, best available science applicable to land management can be applied under this alternative if explicit plan language does not prohibit its application.

Alternative B began its inception by incorporating those plan components from alternative A that would continue to provide meaningful direction to the Grasslands during the future planning cycle of 10 to 15 years, based on identified needs for change during the sustainability and evaluation analyses. Focus group and public scoping meetings and intra-agency and interagency

collaborations led to the development of desired conditions from which all other plan components would tier.

See maps in appendix L for the KRB Management Area, BKMC Management Area, and Mills Canyon Management Area as proposed under alternative B:

Key changes to alternative B, where the working draft plan was rolled, are presented below:

- August–October 2008: Findings of the Kiowa National Grassland Wilderness Evaluation Report resulted in delineation in the draft plan of a Mills Canyon MA distinct from the rest of the KRB MA. Discrete plan components for the Mills Canyon MA were developed that would preserve and protect the semiprimitive features and integrity of the Canadian River IRA.
- December 2008: United States Fish and Wildlife Service (USFWS) changed the listing priority number of candidate status for Lesser Prairie-chicken (LPC) from 8 to 2.[1] This resulted in increased consideration of habitat values in the draft plan to accommodate possible return of species to mixed-grass and shinnery oak vegetation types on the BK NG and the sand sagebrush vegetation type on the KRB NGs.
- March–April 2009: Research on avoidance of various structures by LPC became known to the planning team. This resulted in incorporation of management emphasis in the draft plan to remove trees in otherwise suitable LPC habitat and to incorporate reference to pre-siting recommendations of USFWS wind turbine guidelines.
- May 2009: Research on collisions of LPC with fences became known to planning staff, resulting in an objective to mark 25 to 50 percent of fences in suitable habitat in shinnery and mixed-grass vegetation types on the BK NG.
- September 2009: Keen interests by USFWS, Texas Parks and Wildlife, and others on the RB NG for potential reintroduction of the black-footed ferret (BFF) became known to the planning team. This resulted in more emphasis on providing management direction for black-tailed prairie dog (BTPD) habitat in early-open successional stages on some areas of the shortgrass prairie of the KRB MA, and a management approach that encourages development of a BTPD management plan within 3 years. (BTPDs are prey for the BFF.)
- April 2010: Scoping comment led to the inclusion of feral hogs as undesirable invasive species in the context of the desired condition for invasive plants and animals Grasslands-wide.
- May 2010: Research and public scoping comments on pinyon-juniper structure (horizontal, age, diameter) beneficial to wildlife became known to the planning team and resulted in changes to the desired condition for pinyon-juniper stands on the KRB MA.

[1] Listing priority number (LPN) for each candidate species (48 FR 43098) guidance assigns each candidate an LPN of 1 to 12, depending on the magnitude of threats, immediacy of threats, and taxonomic status. The lower the LPN, the higher the listing priority, based on the magnitude of the threat(s), then by the immediacy of the threat(s), and finally by taxonomic status. Under this priority ranking system, magnitude of threat can be either “high” or “moderate to low.” This criterion helps ensure that those species facing the greatest threats to their continued existence receive the highest listing priority.

Alternative C is identical to alternative B with the exception of the recommendation of a Canadian River PWA (see map, appendix L), which would replace most of the Mills Canyon MA proposed under alternative B. The difference in acreage between the potential wilderness and the Mills Canyon MA would be managed under Grasslands-wide management direction and/or KRB MA direction.

## Summary of Each Alternative

To aid in the comparison of alternatives, each is presented in the context of how they address the needs for change related to ecosystem diversity, managed recreation, and human influences on the Grasslands.

### Common to All Alternatives

The Grasslands plan revision process conforms to the 1982 Planning Rule Provisions, including those for conducting an AMS. The AMS procedures require benchmarks to define the range within which alternatives are developed and analyzed in an EIS. Benchmarks identify the minimum and maximum range for resource outputs.

For this FPEIS, benchmarks were developed for grazing capacity and permitted livestock use, developed and dispersed recreation, soils, and forest products. All alternatives fall within the benchmarks established for these resources.

The benchmarks for developed recreation, grazing capacity, and permitted livestock use have been validated and carried forward from the 1985 plan into the proposed Grasslands plan. The benchmark for dispersed recreation was modified from the 1985 plan because the minimum level benchmark for dispersed recreation far exceeds the number of recreation visitor days on the Grasslands. The minimum benchmark for soil loss was also adjusted from the 1985 plan because it accounts for all of the Cibola NF; it was adjusted as a proportion of the total Forest acres. Forest products benchmarks (net products value, firewood sold, personal use firewood) were similarly not segregated for the Grasslands in the 1985 plan; they were combined into one Forest-wide and Grasslands-wide benchmark. We adjusted this benchmark for the Grasslands to include only the pinyon-juniper stands on the KRB NGs (excluding the IRA) and black locust on the BKMC NGs.

For more information on benchmarks, see appendix H in the draft LRMP or the Kiowa, Rita Blanca, Black Kettle and McClellan Creek National Grasslands CER supplementary document to meet AMS requirements (appendix B of this document) for specific calculations.

### Alternative A

#### Needs for Change Topic 1: Ecosystem Diversity

**Soil**

For soil resources in alternative A, emphasis is placed on inventory and monitoring of soils and using best management practices (BMPs) to mitigate adverse effects of projects on soils. This alternative directs soil improvement projects where watershed condition is unsatisfactory.

### Water

For water resources, emphasis is placed on inventory and monitoring of watershed condition and using BMPs to mitigate adverse effects of projects upon water resources. It would restore impaired riparian areas, and directs watershed improvement projects where watershed condition is unsatisfactory. The desired condition for riparian areas is specified in relation to natural conditions using seven parameters, including crown cover and shade.

### Air

For the air resource, no plan direction is given aside from FSM and FSH direction to comply with Federal and state air quality laws.

### Vegetation

Alternative A does not identify the uniqueness of vegetation types and their inclusions or provide specificity on how land management tools and processes (e.g., fire, grazing) would affect vegetation structure and species composition.

Alternative A emphasizes shinnery oak control and eradication in some areas and would create 100-foot-wide openings in shinnery oak with 200-foot-wide leave strips between openings for high edge contrast and would provide for protection of selected shelterbelts and motts, and for restoration plantings within selected shelterbelts. Alternative A would convert 4,400 acres of shinnery oak to grassland.

### Wildlife

Alternative A would restrict forage improvement activities and limit population control on BTPD towns > 15 acres without prior evaluation in order to protect black-footed ferret (BFF) habitat. BTPD towns < 15 acres could be controlled or limited to improve forage production. This restriction is in conflict with the Region 3 forest sensitive species list revision that now includes the BTPD. The revised sensitive species list supersedes the restrictions and controls on BTPDs and allows BTPD colony expansion.

### Invasive Species

Alternative A utilizes guidance from the “Environmental Assessment for Integrated Pest Management of Noxious/Invasive Plants for the Cibola National Forest and Kiowa and Rita Blanca,” June 2010, that covers treatments to eradicate, control, or contain invasive plants. Alternative A also utilizes the “Environmental Assessment for Invasive Plant Management, Cibola National Forest, Black Kettle Ranger District, Cheyenne, Oklahoma,” August 2007, that covers treatment methods such as cultural, biological, manual, and mechanical control; controlled grazing; prescribed fire; and chemical (herbicide) methods to control invasive plants.

### Climate Change

Alternative A does not directly address climate change but does rely on Agency policy to address climate change.

### Needs for Change Topic 2: Managed Recreation

#### Scenery

Alternative A direction (standards and guidelines) below is applicable to visual resource management on the Grasslands. Table 1 shows the distribution of acres classified as partial retention and modification in BKMC MA and KRB MA from the 1985 plan.

**Table 1. Visual quality objectives under alternative A**

| Visual Quality Objective (acres) | | | | |
|---|---|---|---|---|
| **Management Area** | **Retention** | **Partial Retention** | **Modification** | **Maximum Modification** |
| Black Kettle and McClellan Creek | 0 | 4,100 | 29,012 | 0 |
| Kiowa and Rita Blanca | 0 | 8,186 | 222,656 | 0 |

#### General Guidelines for All Management Areas

Acceptable variations in visual quality objectives (VQOs)[2] classifications from the acreages presented in the standards and guidelines for specific MAs are as follows:

- Preservation: No Change
- Retention: ±2 percent in foreground, ±5 percent in middle ground and background
- Partial Retention: ±5 percent in foreground, ±10 percent in middle ground and background
- Modification: ±10 percent in all zones

As noted below, most management direction for visual quality regards vegetation management or tree harvest:

- Manage for the visual quality objectives of retention or partial retention for developed site plan perimeter using a definition of characteristic landscape which includes manmade features.
- Accomplish viewshed corridor planning as needed for timber sales.
- Inventory for existing visual condition and visual absorption capability.

[2] In the 1970s, the Forest Service introduced the "Visual Management System" (VMS) to classify and identify scenic resources. In 1995, VMS was revised to take into consideration ecosystem management and renamed the "Scenery Management System" (SMS). There are five levels of scenic conditions within each system that can be cross-walked. The corresponding classification levels from VMS to SMS are: *Preservation* is an unaltered landscape and equivalent to a *very high scenic integrity* level; *Retention* appears unaltered and is equivalent to *high scenic integrity*; *Partial Retention* is a slightly altered landscape and equivalent to *moderate scenic integrity*; *Modification* is moderately altered and equivalent to a *low scenic integrity*; *Maximum Modification* is heavily altered and equivalent to a *very low scenic integrity* level. SMS has a sixth level of classification, *Unacceptably Low,* where the landscape appears extremly altered. In the 1970s and 80s, most areas of the Grasslands were classified as *Partial Retention* and *Modification* because of the presence of state and county roads. Although relatively high levels of landscape alteration would have been allowed, it never occurred, and the roads remain lightly used.

- Dispose of all activity slash within seen area or up to about 200 feet on either side of roads and trails where the VQO is retention; retain/enhance retention by having a landscape architect specify growing stock level (GSL), diameter breast height (d.b.h.), and vista opportunities appropriate to each site (coordinated with special GSL and old growth requirements for wildlife); use slash disposal techniques appropriate for the given area.
- Where the foreground VQO is partial retention, the following will be required: Dispose of all activity slash occurring within 200 feet of recreation sites, forest trails, forest roads, and paved or all-weather roads; dispose of slash within 1 growing season after completion of the project which generated the slash; retain/enhance partial retention areas by having a landscape architect specify GSL, d.b.h., and vista opportunities appropriate to a given site; use slash disposal techniques appropriate for the given area.
- Newly created tree stumps in thinning areas will have the cut face away from any recreation sites, trails, or roads within 200 feet of the stumps.
- Manage the Canadian River to preserve its wild, scenic, or recreation river potential.

No additional scenic resource direction is given for this management area.

**Recreation**

*Recreation Opportunity Spectrum.* To preface the concept of Recreation Opportunity Spectrum (ROS) referred to below, the reader is provided with the following short explanation: The ROS classes assigned in the current plan were reviewed and found to be somewhat limiting. Only two ROS settings are applied to the Grasslands inventory: roaded natural and semiprimitive motorized. The ROS classes should provide direction for a full spectrum of recreation activities, including dispersed and developed uses in a variety of outdoor settings. Areas unsuitable for recreation should be identified. For further detail on ROS methodology, see the subsection "Recreation" in chapter 3 under "Needs for Change Topic 2."

Alternative A emphasizes roaded natural settings and opportunities on the BK and MC Units. Both roaded natural and semiprimitive motorized settings and opportunities are provided on the KRB Units, including semiprimitive motorized settings and opportunities in the Mills Canyon IRA. The area around the Santa Fe National Historic Trail is assigned an ROS setting of semiprimitive motorized.

*Dispersed and Motorized Recreation.* Management direction for alternative A emphasizes riparian protection and improvement projects, and dispersed recreation over developed recreation; however, specific direction for the BKMC MA and the KRB MA is silent on dispersed recreation other than motorized use.

Standards and guidelines direct ORV closures or restrictions to protect resources from unpredictable damage. Areas of ORV closure would be indicated by management area and remaining areas would remain open unless other restrictions were made based upon an environmental analysis. Open roads and trails would be signed on the ground, and maps of closure areas would be available. The BKMC NGs have a motor vehicle use map (MVUM) printed and available to the public. The KRB NGs have completed the travel management planning process, and we expect the decision to be signed by mid-June 2012. Amendments to the

current 1985 LRMP designate the open network of public and administrative use roads and trails on each unit. This direction is carried forward into alternatives B and C.

*Developed Recreation.* On the BKMC NGs, new construction and rehabilitation of recreational facilities would generate a significant increase in developed site capacity if implemented. Standards and guidelines in the 1985 plan would provide rehabilitation, addition of capacity,[3] and new construction of multiple recreation sites around Lakes Marvin and McClellan. It would provide for newly constructed facilities at Spring Creek and Black Kettle Recreation Areas. Total additional capacity of 800 "persons-at-one-time" would be added at the BKMC NGs over 50 years. On the KRB NGs, developed site capacity would increase slightly through construction and rehabilitation of recreational facilities. Alternative A would provide newly constructed sites with 150 persons-at-one-time capacity at unspecified locations on the KRB NGs over 50 years and would rehabilitate unnamed existing sites. Guidelines for recreational development would evaluate compatibility with other resources and activities, establish mitigation measures to protect and maintain riparian and wetland habitat, emphasize developments that cause no deviation in visual quality classification, control sedimentation using BMPs for road design and construction, and provide adequate provisions for effluent and wastewater treatment.

**Nature-Based Tourism**

Alternative A does not provide direction for managing nature-based tourism on the Grasslands; however, cooperative programs with state and Federal agencies and nongovernmental organizations (NGOs) are in place to facilitate conservation of natural and cultural resources, and to promote rural economic development across the Grasslands.

**Heritage Resources**

Alternative A would provide heritage resources with protection from other management activities, direct heritage resources to be in line with Federal statutes and state authorities, and call for proactive preservation, interpretation, and monitoring measures.

**Special Areas**

*Research Natural Areas (RNAs).* RNAs are addressed in the 1985 plan within the forest-wide standards and guidelines and the "Summary of the Analysis of the Management Situation." The standards and guidelines stipulate that about 300 acres in each of BK and KRB NGs would be studied for possible designation as RNAs for the study and protection of native vegetation. The "Summary of the Analysis of the Management Situation for Research Natural Areas" identified mixed-grass prairie on the BK NG and shortgrass prairie on the KRB NGs as suitable types for evaluation. Alternative A contains no desired conditions or objectives for RNAs, and they would not be addressed in monitoring.

*Scenic Byways and National Historic Trail.* Alternative A has no desired conditions, objectives, guidelines, or standards for managing historic trails and scenic byways on the NGs. The scenic byways are cooperatively managed with other state and Federal agencies. The Forest Service and National Park Service cooperatively manage the Santa Fe National Historic Trail as a National Historic Landmark.

[3] Addition of capacity is measured as an increase of "persons-at-one-time" (PAOT) for a given site.

*Canadian Eligible Scenic River.* Guidelines under the KRB MA would direct management of the Canadian River to preserve wild, scenic, and recreation river potential and acquire private lands within the corridor in order to preserve the unique qualities of the river. There are no desired conditions or objectives for the Canadian River; however, standards and protections for wild/scenic/recreation river are contained within the forest-wide prescriptions (amendment 10). Under this option, the river segment would remain eligible for future designation, and protections described in amendment 10 of the 1985 forest plan would continue to apply in accordance with FSM 2354.

**Wilderness**

Alternative A would not recommend wilderness designation for Mills Canyon.

### Needs for Change Topic 3: Human Influences

**Roads and Access**

Alternative A provides direction on decommissioning unneeded, unauthorized roads but not NFS roads, and no direction is provided regarding methods of decommissioning. Alternative A also provides no Grasslands-specific direction regarding legal access but does provide Grasslands-specific travel management decision support.

**Land Adjustment**

Land adjustment acquisition will result in no difference in management direction by alternative for desired condition. Acquisition is based on a willing seller and lands which have been identified that would improve the Agency's ability to carry out its mission on the Grasslands. Desired lands shall provide for road or trail access; have high quality natural or cultural resources; improve management of designated special areas; contain important plant or animal habitat; contain or influence wetlands, flood plains, or riparian areas; or provide opportunities to rehabilitate or stabilize public lands.

**Minerals and Energy Development**

Alternative A primarily addresses the fact that mineral production would continue. Alternative A also stipulates the action to take on all locatable mineral operating plans, lease applications, and common variety mineral permits as outlined in 36 CFR 228 and FSM 2822.41. Amendment 12 to the current plan adds standards on surface occupancy and closed loop drilling. It excludes surface occupancy of the Mills Canyon area but does not bar the material from being accessed/extracted from adjacent lands.

**Special Forest Products**

Alternative A would allow for the disposal of forest products through sales or free use but gives little direction on where or for what purpose. It directs that areas should be evaluated for their suitability for firewood gathering, and that firewood gathering would not be allowed in designated RNAs.

**Special Uses**

Special uses are authorized per a review on a case-by-case application process for a project, and require project-specific NEPA. Alternative A provides general goals and direction for special use administration and authorization while following FSM, FSH, laws, regulations, and policy. It

would designate existing transmission rights-of-way as corridors and provide for joint use in corridors. It is silent on any particular special use authorization and development, including energy development.

**Wind Energy Development**

Wind energy development is authorized by the special use program requiring project-specific NEPA analysis. Alternative A does not address wind energy per se, and it provides general goals and direction for special use administration while following FSM, FSH, laws, regulations, and policy. Alternative A would designate existing transmission rights-of-ways as corridors, and provide for joint use in the corridors. It is silent on alternative energy development.

**Livestock Use**

Alternative A would provide for livestock grazing, range improvement construction, and implementation of conservative management and utilization levels. Livestock grazing on the Grasslands is managed according to decisions made after NEPA analysis. The provisions in these decisions prescribe conservative utilization levels and adaptive management principles that allow for variable livestock numbers and seasonal flexibility. These are applied so that the desired vegetation condition may be maintained or approached. These NEPA decisions apply to this alternative.

Alternative A would emphasize forage for sustained livestock yields and technology to improve range condition.

Alternative A would increase forage on 4,400 acres as shinnery oak would be treated and converted to grassland.

**Wildland-Urban Interface and Fire Management**

Alternative A would establish wildland fire use and prioritized fuel reduction treatments, provide for meeting Federal and state air quality regulations, select an appropriate suppression strategy on all fires, develop and annually update fire management plans, use unplanned fires to meet resource objectives, reduce the number of human-caused wildfires, and increase public awareness for the need to use fire as a management tool.

## Alternative B

### Needs for Change Topic 1: Ecosystem Diversity

**Soil**

Alternative B has a desired condition for soils that strives for satisfactory conditions and soil losses that rarely exceed natural levels. Soils would be stabilized in the long term, with the exception of some soil movement associated with BTPD towns. Guidelines direct that soil-disturbing activities prevent discharge into water bodies; provide direction for restoration, mitigation, and rehabilitation of construction sites; and give direction on treatment of gullies and unsatisfactory or impaired soils.

### Water

Alternative B has a desired condition for surface water features to be in properly functioning condition. The desired condition for watershed is to manage toward a Class I watershed condition.

### Air

Alternative B includes a desired condition for air resources, which is that that air quality conditions be at acceptable attainment levels on the Grasslands.

### Vegetation

Alternative B would provide ecosystem restoration and maintenance on a landscape scale. Alternative B provides desired conditions directly related to structure and composition for each vegetation type, and the objectives and guidelines would promote desired vegetation structure and species composition. Habitat for wildlife species would be secured by moving each vegetation type toward desired vegetation structure and species composition.

### Wildlife

Alternative B would encourage BTPD colony expansion on the KRB MA. This would possibly result in an increase in early successional plant communities in those areas of shortgrass prairie with soils and slopes typically selected by BTPDs. A BTPD management plan would be recommended. A long-term desired condition would have sufficient habitat available for BTPD complexes to accommodate potential reintroduction of black-footed ferrets as a natural predator.

### Invasive Species

Alternative B would use Grasslands-wide and district-specific invasive species control and would allow for removal of invasive or nonnative trees from historical grassland vegetation communities or in otherwise suitable LPC habitat on the BK NG following site-specific assessment. Objectives and guidelines would promote the desired condition.

### Climate Change

Alternative B includes a plan component that emphasizes adaptive management responses in the event of climate change and non-plan components that suggest tools for recognizing effects of climate change and potential strategies for response.

## Needs for Change Topic 2: Managed Recreation

### Scenery

Alternative B provides desired conditions and supporting objectives and guidelines for maintaining and enhancing the scenic resources, especially in areas assigned a high scenic integrity objective (SIO).[4] Table 2 summarizes SIOs for the Grasslands under alternative B.

[4] In the 1970s, the Forest Service introduced the "Visual Management System" (VMS) to classify and identify scenic resources. In 1995, VMS was revised to take into consideration ecosystem management and renamed the "Scenery Management System" (SMS). There are five levels of scenic conditions within each system that can be cross-walked. The corresponding classification levels from VMS to SMS are: *Preservation* is an unaltered landscape and equivalent to a *very high scenic integrity* level; *Retention* appears unaltered and is equivalent to *high scenic integrity*; *Partial Retention* is a slightly altered landscape and equivalent to *moderate scenic integrity*; *Modification* is moderately altered

On the Kiowa NG, a high SIO would be assigned to Mills Canyon, including the Mills Canyon and Mills Rim Campgrounds, Sauz Creek, and Sugar Loaf Mountain area. In the eastern part of the K NG and the RB NG, a high SIO would be assigned to the Thompson Grove picnic area, the area known as the "High Lonesome," and the units that contain the Santa Fe Trail. Future management emphasis would include managing for high scenic integrity where the valued landscape character "appears" intact. Deviations may be present but must repeat the form, line color, texture, and pattern common to the landscape character so completely and at such scale that they are not evident.

The remainder of the Kiowa NG would be proposed for a moderate SIO where noticeable deviations should remain visually subordinate to the landscape character being viewed. The eastern K NG and the RB NG would be managed for both moderate and low SIO. The proposed SIO map is available in appendix L.

On the BK NG, the area around Croton Creek and the units near developed recreation sites would be proposed for high SIO levels. All of the MC NG would be proposed for high scenic integrity. The remaining units on the BK NG would be proposed for moderate SIO levels.

Large industrial wind farms would be restricted within the foreground in areas of high scenic integrity. Mitigations would be proposed for high SIO to reduce the impacts from oil and gas exploration and extraction.

Differences in total acres among alternatives is due to changes in land ownership, mapping technology, and rounding.

**Table 2. Scenic integrity objectives under alternative B***

| Scenic Integrity (acres) | | | | |
|---|---|---|---|---|
| **National Grassland** | **High SIO** | **Moderate SIO** | **Low SIO** | **Very Low SIO** |
| Black Kettle and McClellan Creek | 7,082 | 25,630 | 0 | 0 |
| Kiowa and Rita Blanca | 75,929 | 114,249 | 40,705 | 0 |

* Acreages were computed by geographic information system analysis and may not match official fee-simple acreage reported for the entire Grasslands.

### Recreation

*Recreation Opportunity Spectrum Classes*. This alternative proposes changes to the ROS settings. The addition of two more ROS classes—semiprimitive nonmotorized and rural—provides more latitude for recreation planning to better reflect the management of the Grasslands proposed in this revision. There would be a substantial increase in semiprimitive motorized ROS settings on the BKMC units. The desired condition for these areas is for providing natural conditions, with few facilities and little development, and motorized use is permitted. This alternative would

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and equivalent to a *low scenic integrity*; *Maximum Modification* is heavily altered and equivalent to a *very low scenic integrity* level. SMS has a sixth level of classification, *Unacceptably Low*, where the landscape appears extremly altered. In the 1970s and 80s, most areas of the Grasslands were classified as *Partial Retention* and *Modification* because of the presence of state and county roads. Although relatively high levels of landscape alteration would have been allowed, it never occurred, and the roads remain lightly used..

assign 36 acres of NFS lands around the district ranger's office and Cheyenne City Park as rural and would include dispersed recreation opportunities.

This alternative provides a substantial increase in semiprimitive motorized settings and opportunities on the KRB unit. The desired condition for these areas provides for recreation opportunities in natural appearing settings, with limited amenities. The proposed Mills Canyon MA (7,911 acres) and the area around the Santa Fe National Historic Trail would be classified as semiprimitive nonmotorized, which would permit nonmotorized uses only. This alternative assigns 1,409 acres of rural ROS setting around commercial and industrial developments on the KRB NGs, and would be considered unsuitable for recreation (see appendix H, "Recreation Suitability").

*Dispersed and Motorized Recreation.* Camping and site intensive recreation would be restricted to areas where limited environmental impacts might occur. Day hiking, hunting, fishing, and primitive camping are the most frequent activities. Other guidelines include closure or rehabilitation to protect or enhance resource conditions. Dispersed camping would be restricted within 200 feet of historic sites, trailheads (except those trailheads with designated dispersed sites already in use), interpretive sites, and stock water. Management strategies emphasize coordination with other agencies and organizations to identify where new partnerships may exist to expand hiking or other dispersed recreation opportunities.

Motor vehicle use would be allowed as identified on motor vehicle use maps (MVUMs). Motor vehicle use would be especially limited in Mills Canyon and the Santa Fe National Historic Trail area because of the ROS setting. A range of recreation opportunities are provided that are consistent with ROS settings of rural, roaded natural, semiprimitive motorized, and semiprimitive nonmotorized.

*Developed Recreation.* Alternative B provides for a range of developed recreation facilities; however, new developments would be limited due to lack of demand. Emphasis would be on maintaining and rehabilitating existing developments. Developed sites would integrate natural and cultural elements, and emphasize sustainability and efficiency in construction and operation. All developed and administrative sites would comply with the applicable accessibility guidelines. Potable water systems would be available where appropriate. Guidelines for new recreation developments would establish a one-half mile buffer from wind energy and oil/gas developments. Maintenance, construction, and design would be consistent with ROS settings, scenic integrity objectives, and "The Built Environment Image Guide for the National Forests and Grasslands." The BKMC NGs would feature lake-based recreation. New or renovated facilities would accommodate large recreation vehicles and provide conveniences where appropriate. The plan objective is to maintain one third of trail miles annually. Guidelines would restrict boat wakes except at McClellan Creek Recreation Area.

Travel management decisions related to motorized use and the associated plan amendment would be carried forward from the 1985 plan into alternative B.

**Nature-Based Tourism**

Alternative B would emphasize ecotourism, bird watching, and wildlife viewing. Other opportunities would include auto tour routes, developed recreation sites, and interpretive programs. Objectives would include offsite educational enrichment programs, signing, and interpretive materials. Management approaches would encourage cooperation with other agencies

and NGOs in planning scenic byway corridors, important bird areas, watchable wildlife stations, interpretive services, and auto tour routes to promote Grassland visitation and tourism.

**Heritage Resources**

Alternative B augments the Federal statutes and state authorities and preservation and interpretation practices by identifying additional Grasslands-wide preservation projects, emphasis on public outreach, interpretation, and development of a site steward program.

**Special Areas and Areas of Interest**

*Research Natural Areas (RNAs).* A review and analysis (1982 Rule Provisions Section 219.25) of ecological conditions for each underrepresented and very underrepresented vegetation type was conducted to determine their potential for designation as a RNA (appendix D). No vegetation type on any of the Grasslands was found to meet the criteria for RNA designation and, thus, no RNAs are recommended under this alternative.

*Scenic Byways and National Historic Landmark.* Alternative B includes desired conditions for one national historic landmark and two scenic byways: The Santa Fe National Historic Trail, Santa Fe Trail National Scenic Byway, and La Frontera del Llano Scenic Byway (state designation only, as of this writing).

The desired condition for the Santa Fe National Historic Trail is to demonstrate the inherent physical integrity and cultural, natural, and scenic resources consistent with the National Preservation Act of 1966 as amended, and the (USDI, National Park Service) “Santa Fe National Trail Comprehensive Management and Use Plan.” Objectives include closing and/or rehabilitating roads that impact the Santa Fe National Historic Trail. The trail itself is a national historic landmark and is nonmotorized.

The desired condition for the Santa Fe National Scenic Byway is to provide access to remnant portions of the Santa Fe National Historic Trail; scenery (landscape view) is of open grassland and sweeping plains. The desired condition for La Frontera del Llano Scenic Byway near Mills is to connect historic and scenic attractions and retain scenic viewsheds to the vast open spaces and wildlife. Objectives for La Frontera del Llano Scenic Byway would construct interpretive signing to associate the byway with the Kiowa NG and Mills Canyon. The management approach for alternative B would emphasize partnerships and projects to support economic goals and protect the resources for which the trail or byways were designated. Under this alternative, the Grasslands may coordinate with other agencies to maintain consistency in signing and appearance of the trail and associated features.

*Canadian Eligible Scenic River.* Alternative B would preserve the scenic river features found in Mills Canyon but does not recommend scenic river designation. An objective under this alternative is to close or rehabilitate all unauthorized motorized vehicle stream crossings in the eligible scenic river corridor within 10 years of plan approval.

**Wilderness**

Alternative B would not recommend wilderness designation but would create a Mills Canyon MA from a portion of the Canadian River IRA. Alternative B would change the ROS classification from semiprimitive motorized to semiprimitive nonmotorized to preserve the wilderness character.

### Needs for Change Topic 3: Human Influences

#### Roads and Access

Alternative B provides direction on decommissioning unneeded, user-created roads, and NFS roads. Methods of decommissioning are also addressed. Alternative B also provides Grasslands-specific direction regarding obtaining legal access to fragmented units.

#### Land Adjustment

This alternative would provide direction for acquiring lands that improve the Grasslands' ability to carry out its mission.

#### Minerals and Energy Development

Alternative B would provide clear objectives pertaining to reclamation measures associated with retired production sites. The plan's guidelines would govern how and when reclamation should be performed. Standards are provided related to how and where drilling operations can be conducted. Alternative B contains a standard that addresses removal and deposition of drill fluids and cuttings from closed loop systems. Alternative B also addresses distances to be maintained from riparian areas and steep slopes unless the operator demonstrates that the activities can be performed without loss of long-term site productivity. Guidelines in alternative B address BMPs associated with roads accessing energy development sites.

#### Special Forest Products

Alternative B would recommend the disposal of forest products through sales or free use and would give clear direction on when and how disposal would occur. Grasslands would provide firewood, construction wood (posts, poles, stays), and wildlings when consistent with meeting desired conditions. Individual firewood permits for personal use would be limited to the amounts typically needed for domestic household use (12 cords) in one year's time if firewood is limited. Firewood and other personal use forest products would be offered free when fee permits are not practical. Managers recognize the right of tribes to collect forest products for noncommercial, traditional, and cultural purposes.

#### Special Uses

Alternative B recommends raptor protection guidelines be implemented for all power, energy, and communication sites. This alternative also directs use of existing rights-of-way to provide utility access to private lands or for cross-country energy transmission, and restricts ground-disturbing activities within 500 feet of eligible National Historic Register sites. Alternative B aspires to minimize fragmentation and effects to wildlife habitat by energy transmission infrastructure.

#### Wind Energy Development

Alternative B would recommend guidelines for wind energy development and energy transmission corridors. It further recommends avoidance of wind energy development within: (1) 500 feet of eligible National Historic Register areas, (2) ½ mile of BTPD colonies, (3) ½ mile of airport approaches and departure paths, and (4) ½ mile of developed recreation sites.

#### Livestock Use

Alternative B would contribute to local economies by offering livestock grazing permits and demonstrating grassland agriculture and would contribute to preserving large areas of open space

and preserving the rural and cultural heritage of the southern Great Plains. Livestock use would provide for conditions that support the sustainability of diverse, healthy, herbaceous and woody plant communities and animal populations while protecting wetlands, streams, habitat, and soils from undesirable impacts. The same NEPA decisions discussed under alternative A apply to this alternative as well.

**Wildland-Urban Interface and Fire Management**

Alternative B emphasizes reducing the threat of wildfire to communities by treating wildland-urban interface (WUI) areas and would provide for an annual treatment of 2,000 to 3,000 acres per year with prescribed fire, mechanical methods, and/or thinning to reduce fire hazard in the WUI areas. A standard would require that response to unplanned ignitions meet either protection or resource objectives. Coordination with other jurisdictions in response to unplanned ignitions should be emphasized. Future planned ignitions should mimic the historical role of fire to achieve resource objectives.

## Alternative C – Wilderness Alternative

### Needs for Change Topic 1: Ecosystem Diversity

**Soil**

Alternative C for soils is identical to alternative B.

**Water**

Alternative C for water and watersheds is identical to alternative B.

**Air**

Alternative C for the air resource is identical to alternative B.

**Vegetation**

Alternative C would limit management tools that could be used in the ecosystem restoration and maintenance of the Canadian River. FSM 2320, Wilderness Management, would govern use of management tools within the potential wilderness.

**Wildlife**

Alternative C would be identical to alternative B, except that management of habitat in the potential wilderness would be subject to Forest Service directives and constraints on use of certain tools in a wilderness area.

**Invasive Species**

Alternative C would be identical to alternative B, except that invasive species management in the Canadian River PWA would have some limitations on management tools that could be used. FSM 2320, Wilderness Management, would govern use of management tools within the potential wilderness.

**Climate Change**

Alternative C is identical to alternative B regarding climate change.

### Needs for Change Topic 2: Managed Recreation

#### Scenery

The acres delineated for the respective scenic integrity objectives for alternative C would be identical to those for alternative B. The wilderness recommendation would exclude a 150-foot corridor on either side of the centerlines of Forest Roads K600, 601, and 602 and would also exclude the developed campground and Mills Ranch (homestead site) within Mills Canyon.

#### Recreation

Alternative C would be identical to alternative B regarding developed, dispersed, and motorized recreation, except that the Canadian River PWA would be managed in accordance with FSM 2320.

#### Nature-Based Tourism

Management for nature-based tourism under alternative C would be the same as alternative B everywhere except that the Canadian River PWA would be managed in accordance with FSM 2320.

#### Heritage Resources

Alternative C would not differ from alternative B with respect to heritage resources; heritage and cultural resources would be managed in accordance with FSM 2320 in the Canadian River PWA.

#### Special Areas/Areas of Interest

*Research Natural Areas (RNAs).* Alternative C would be the same as alternative B with regard to RNAs.

*Scenic Byways and National Historic Trail.* Management for scenic byways and national historic trail under alternative C would be the same as alternative B. These special areas do not occur in the Canadian River PWA.

*Canadian Eligible Scenic River.* Alternative C management direction for the Canadian Eligible Scenic River would be the same as alternative B. See the map "Special Areas and Eligible Scenic River" in appendix L.

#### Wilderness

Alternative C proposes to recommend the Canadian River PWA for designation. The potential wilderness would be governed by directives stated in FSM 2320.

The Canadian River PWA would be 6,032 acres, of which 5,444 acres are national grassland and 584 are State Trust lands.[5] The area would be defined geographically by Mills Canyon with

[5] The Cibola NF and NGs acknowledge that the potential wilderness as described and configured in alternative C includes approximately 584 acres of New Mexico State Land Office (SLO) land. This alternative does not commit the SLO to the exchange or sale of that parcel to the U.S. Forest Service. If the Forest Service responsible official selects alternative C as the preferred Grasslands plan, consultation with the SLO as to willingness to exchange or sell said land would be further pursued during the interim between draft and final environmental impact statements. If the SLO does not wish to exchange or sell the land in question, the boundaries of the potential wilderness would be adjusted and the wilderness reduced in size. Similarly, recommendation of wilderness would not affect the management of adjacent State land. If the area were to be designated by Congress as wilderness, it would not prevent any activity or development from taking place on adjacent State or private land. Non-Federal lands surrounded by wilderness are

elevations ranging from 6,100 feet at the river to 6,800 feet at the canyon rim. The PWA was evaluated for capability, availability, and need. The findings of the evaluation were used to determine whether or not to make a preliminary administrative recommendation for wilderness designation of the Canadian River PWA. No recommendation has been made.

Alternative C would have a desired condition for the Canadian River PWA as follows:

> The Canadian River PWA maintains its wilderness characteristics, i.e., natural appearance, tranquility, low interaction with other users, etc. Vegetation structure is in low departure from reference condition structure. Natural processes such as fire, insects, drought, disease, and grazing control vegetation composition and structure. The area has an open, natural or natural appearing landscape with a healthy riparian habitat and minimal presence of invasive species. Generally, opportunities for primitive recreation and a moderate degree of solitude are available. There is some evidence of past and present human use, such as fences, barriers, trails, old buildings, water developments, and primitive roads. Existing two-track roads and old roads rehabilitate naturally through lack of use; some of these routes may become nonmotorized system trails. Bridges or other structures may exist to protect resources.

### Needs for Change Topic 3: Human Influences

#### Roads and Access

Alternative C would not differ from alternative B, except that decommissioning of user-created roads and trails would not occur after designation.

#### Land Adjustment

In alternative C, land adjustment direction would be the same as alternative B.

#### Minerals and Energy Development

Alternative C would be identical to alternative B.

#### Special Forest Products

Alternative C would be similar to alternative B, except that FSM 2320 would govern removal of wildlings and forest products within the potential wilderness.

#### Special Uses

Alternative C would be similar to alternative B, except that FSM 2320 would govern special use permits within the Canadian River PWA.

#### Wind Energy Development

Alternative C would be similar to alternative B, except that FSM 2320 would govern special use permits such as wind energy development within the Canadian River PWA.

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ensured adequate access to their property in accordance with FSM 2326.13. Non-Federal lands that have access available from outside the wilderness will not be entitled to access their properties through a wilderness area.

**Livestock Use**

Alternative C would be the same as alternative B with regard to livestock grazing, but would be subject to FSM 2320 directives in the Canadian River PWA.

**Wildland-Urban Interface and Fire Management**

Alternative C provides the same WUI and fire management direction as alternative B. However, WUI would not apply in a wilderness, and planned and unplanned ignitions would be subject to directives in FSM 2320. Planned ignitions would be allowed when mimicking the historical fire regime for the vegetation type present in the wilderness (pinyon-juniper) and for fuel reduction.

## Alternatives Considered But Eliminated from Detailed Study

Federal agencies are required by NEPA to rigorously explore and objectively evaluate all reasonable alternatives and to briefly discuss the reasons for eliminating any alternatives that were not developed in detail (40 CFR 1502.14). Public comments received in response to the proposed action provided suggestions for alternative methods for achieving the purpose and need. Some of these alternatives may have been outside the scope of plan revision, duplicative of the alternatives considered in detail, or determined to be components that would cause unnecessary environmental harm. Therefore, a number of alternatives were considered, but dismissed from detailed consideration for reasons summarized below.

*Expanded Canadian Potential Wilderness Area Alternative.* This alternative was formulated in response to public comments received during the scoping phase of the NEPA process. This "Expanded Wilderness Alternative" was considered but not studied in detail for multiple reasons:

- The presence of built features such as fences and roads that would be included in an expanded version of alternative C would be incompatible with wilderness values.
- Inclusions of properties that are privately owned or managed by other agencies.
- The "Expanded Wilderness Alternative" would, in concept, include substantial acreage above the canyon rim within the pinyon-juniper and shortgrass prairie vegetation types and increase frontage with private property, thereby increasing potential for illegal motorized access into a wilderness area.
- Enforcement issues restricting motorized access under alternative C would be exacerbated under this potential alternative.
- No proponent of the expanded boundary has provided a detailed map or detailed description of the proposed expansion area.

*Research Natural Areas Alternative.* This alternative was considered in response to public comments received during the scoping phase of the NEPA process. Some commenters recently proposed designation of RNAs on both the Kiowa and Rita Blanca NGs. The RNA alternative was considered, but not studied in detail because the ecological condition of the vegetation is at present not considered to be in a sufficiently natural condition to serve as a baseline or reference area to assist in guiding resource management decisions.

Alternative A would provide direction to study a 300-acre RNA on each of three NGs—BK, K, and RB—for possible designation. A final report (Dunmire 1987) was prepared by The Nature Conservancy that describes field methods and findings. Dunmire (1987) identified and described four primary sites with RNA potential for KRB NGs—Units K-3, K-46, K-100, and RB-19. The Southwestern Region RNA taskforce visited those sites again in 1988 to evaluate the areas for possible designation. In July 1988, the taskforce formally recommended that the region proceed with designation for Unit K-46 and portions of Unit K-3 on the Kiowa NG. Unit K-46 was considered to be an excellent example of the blue grama-buffalograss ecosystem, and Unit K-3 presented an excellent example of the sand sagebrush ecosystem. Of principle interest was a large area of sandhills prairie in good condition (Dunmire 1987).

In 1991, an establishment record was prepared by the Nature Conservancy for Unit 46, Kiowa Shortgrass RNA. However, this unit was not recommended by the forest supervisor or regional forester due to conflicts between restrictive RNA management guidelines and the long-term fire effects research being conducted by the Rocky Mountain Research Station at the site. On May 18 and 19, 2010, as a result of scoping comments received, three areas identified by Dunmire (1987) were reevaluated by KRB district staff using cover frequency transects and ocular observation to document current conditions. These were Kiowa Units K-100 and K-3 and Rita Blanca Unit RB-19. Kiowa Unit 46 was not reevaluated.

The evaluation on Unit K-100 revealed that canopy cover had apparently changed since 1987, and galleta has since become the most visually dominant species, although the frequency transects show that galleta and blue grama are equal in canopy cover at 32 percent each. Bare ground in 1987 was less than 10 percent, but bare ground was 20 percent in 2010. Based upon structural improvements added since 1987 and the shift in plant composition, this unit is not considered a good candidate for RNA designation.

In 1987, Unit K-3 was proposed as a good candidate as RNA for the sand sagebrush-blue grama ecosystem. At that time, the sand sagebrush cover was reported as 10 to 20 percent. In May 2010, district staff measured canopy cover both inside and outside of a small exclosure within the unit. Line intercept transects showed that shrub canopy within the exclosure was 50 percent, and outside the exclosure it was 33 percent. This is much higher than is considered a late successional seral stage for sand sagebrush. The existing infrastructure, old plowed field, current cultivation surrounding the area, and shift in canopy cover make this area not suitable for RNA designation.

In 1987, Unit RB-19 of the High Lonesome was considered a good candidate as RNA for the shortgrass ecosystem. No transects were read for this evaluation, but field observation in 2010 indicated that there was a much higher incidence of threeawn and forbs than were present in 1987. Broom snakeweed, which was rare in 1987, was common in 2010. Past disturbance, historical grazing pressure, and the apparent shift in plant composition make this area not suitable for RNA designation.

Because none of these particular units met regional criteria for recommendation as RNA, an alternative was not considered in detail that recommended them.

*Species Reintroduction Alternative.* Some environmental groups advocated during the public comment period on the proposed plan and DEIS that there should be an alternative for reintroducing bison and Lesser Prairie-chicken (LPC). Such an alternative was considered, but eliminated from detailed study, as strategic plans do not reintroduce species; they provide for

habitats that allow for future species introduction decisions. Alternatives B and C provide for suitable LPC habitat and do not inhibit future reintroduction decisions. Regarding reintroduction of bison, the agency can administratively consider a request to stock bison on the Grasslands under any EIS alternative, including the no action alternative A. Either a permittee or a state wildlife agency could request a permit to run bison on an allotment authorized to them. A project-specific environmental analysis would need to be conducted upon such a request. Thus, this alternative was considered, but eliminated from detailed study.

*Deemphasized or Disallowed Grazing Alternative.* During the proposed plan and DEIS public comment period, some commented that an alternative to exclude livestock grazing should have been considered. Such an alternative was considered but eliminated from detailed study, as it would not be consistent with the Multiple Use–Sustained Yield Act. Furthermore, grazing, whether by native or domestic ungulates, has historically been one of the processes that have led to the structure and composition features that form the basis of vegetation reference conditions on the Grasslands. Grazing is also an important management tool used to manipulate habitat for wildlife by the intensity, duration, and timing of livestock use. Under all alternatives, adaptive management may deemphasize livestock grazing in response to drought, fire, or other conditions where destocking will help maintain or achieve desired conditions.

*Single-Resource Emphasis Alternatives.* During the public comment period on the proposed plan and DEIS, some commenters encouraged a supplemental EIS or FEIS with additional alternatives with single-resource emphasis on wildlife, water quality, soil productivity, nature-based or ecotourism, open spaces, renewable energy, and nonmotorized recreation. Additional alternatives that emphasize management of single resources, goods, or services were considered but eliminated from detailed study because alternatives B and C provide sufficient flexibility and guidance to accommodate all of those resources, and they are not mutually exclusive. Both alternatives provide plan components (desired conditions, objectives, guidelines or standards, suitability, and monitoring elements) for each of these resources, goods, or services. Forest Service Manual and Forest Service Handbook directives, laws, regulations, and policy provide additional management guidance for these resources, goods, and services, and were identified by topic area in appendix D of alternatives B and C. Thus, single-resource emphasis alternatives were considered but eliminated from detailed study.

## Summary Comparison of Consequences by Alternative

This section provides a summary of the environmental consequences of alternatives by need-for-change topic. Information in table 3 focuses on management direction and issues where different consequences can be compared quantitatively or qualitatively among alternatives.

As an aid to the decision maker and the public, table 3 addresses differences among alternatives where environmental consequences are anticipated to be important. Further detailed discussion of differences can be found in the “Environmental Consequences” sections of chapter 3. The organization of the respective needs for change and resource topics in this table is the same as that found in chapter 3.

**Table 3. Summary comparison of consequences of alternatives on the biological, social, and physical environments**

| Environment | Consequences Comparison by Alternative: Alternative A | Alternative B | Alternative C |
|---|---|---|---|
| **Needs for Change Issue: Ecosystem Diversity** | | | |
| Soils | No major differences among alternatives. | | |
| Water | Would not improve river connectivity and structural components of channels and riparian areas toward proper functioning condition. | Would improve river connectivity and structural components of channels and riparian areas toward proper functioning condition. | |
| Air | No major differences among alternatives. | | |
| Mixed-grass prairie | This alternative would protect and maintain shelterbelts and would allow continued encroachment of undesirable native invasive trees such as eastern redcedar and black locust, which would be contrary to desired vegetation structure and species composition. | Implementation would achieve desired vegetation structure and species composition of the mixed-grass prairie across the landscape by reducing the presence of undesirable native trees such as eastern redcedar and black locust. | |
| Shinnery oak | Areal coverage of shinnery oak would be reduced by about 12 percent. Control of undesirable native invasive trees would not be prioritized and could result in a slow drift away from desired vegetation structure and species composition. | Implementation would maintain or slowly increase acreage of this vegetation type on the BK NG. This alternative would result in removal of undesirable native invasive trees (e.g., black locust and eastern redcedar) within shinnery oak. Implementation would result in shinnery oak on BK NG moving toward the treeless desired condition for this vegetation type, and application of managed grazing, planned fire, or mechanical or chemical tools would result in achievement of desired vegetation structure and species composition. | |
| Mixed hardwood riparian | Implementation would allow higher fuel loads from encroachment by eastern redcedar in the understory, increasing mortality of deciduous trees. | Implementation would result in reducing encroachment of eastern redcedar in the understory, thereby lowering fuel loads.<br>More clearly defined targets for vegetation structure and composition would move this vegetation type toward reference condition. | |
| Shortgrass prairie and inclusions | Implementation would allow managed grazing and planned fire, but since there is no direction defining structure and composition, outcomes would be uncertain. | Implementation would move this vegetation type toward desired vegetation structure and species composition, as targets for species composition and structure are clearly defined. | |
| Pinyon-juniper and juniper grasslands inclusions | Implementation may result in this vegetation drifting from reference condition for vegetation structure, as there are no defined targets. | Implementation would result in moving toward desired vegetation structure and species composition by focusing on early seral stage development. | |

**Consequences Comparison by Alternative**

| Environment | Alternative A | Alternative B | Alternative C |
|---|---|---|---|
| Cottonwood-willow riparian (excluding Canadian River) | Implementation may result in this vegetation drifting from reference condition for vegetation structure, as there are no defined targets. | Implementation would move this vegetation type toward defined desired vegetation structure and species composition through invasive species control, restoration plantings, and managed livestock use. | |
| Sand sagebrush | Sand sagebrush would be maintained in its current state or possibly move away from reference condition for vegetation structure as this alternative has no defined targets. | Implementation would move this vegetation type toward desired structure and species composition targets. | |
| Canyon lowlands and cottonwood-willow riparian and Canadian River | There is no direction defining structure and composition. Outcomes would be uncertain. | Implementation would move toward a defined structure and composition outcome for the Canadian River cottonwood-willow riparian vegetation with focus on early seral stage development. | Same as Alternative B except wilderness designation would delay achievement of desired vegetation structure and species composition outcomes because of limitations on use of motorized management tools. |
| **Federally Listed Threatened, Endangered, and Candidate Species** | | | |
| Interior Least Tern on aquatic lakes | In general, implementation of plan components related to the improvement of watershed conditions, minerals/energy development, recreation, and grazing management should result in positive effects to the Interior Least Tern by indirectly protecting foraging habitat occasionally used by the Interior Least Tern. Implementation would result in a "May Affect, Not likely to Adversely Affect" determination for the Interior Least Tern. | | |
| Arkansas River shiner on aquatic lakes | In general, implementation of plan components related to the improvement of watershed conditions, minerals-energy development, recreation, and grazing management should result in positive effects to the Arkansas River shiner by indirectly protecting watersheds that drain into occupied habitat in the Canadian River in Texas and Oklahoma. Implementation of any alternative may render a "May Affect but is Not Likely to Adversely Affect" determination for the Arkansas River shiner. | | |
| **Viability-High At-Risk Species** | | | |
| Lesser Prairie-chicken on mixed-grass Prairie | Suitable habitat = 70−88 percent (7,910−9,940 acres) of the vegetation type.<br>Undesirable tree encroachment on mixed-grass prairie would degrade potential and suitable habitat for LPC. Implementation would result in greater viability risks to the Lesser Prairie chicken and may result in Federal listing. | Suitable habitat = 90−96 percent (10,170−10,850 acres) of the vegetation type.<br>Desired vegetation structure and species composition would enhance habitat by reducing the presence of undesirable trees. LPC mortality caused by collision with fences would be reduced.<br>Under Alternatives B and C, there would be no loss of viability or trend toward future listing. | |

**Consequences Comparison by Alternative**

| Environment | Alternative A | Alternative B | Alternative C |
|---|---|---|---|
| Lesser Prairie-chicken on shinnery oak | Suitable habitat = 70−88 percent (13,320− 16,630 acres) of the vegetation type.<br>Mast (acorns) for LPC would be reduced due to reduction of shinnery oak acreage. Undesirable trees would degrade potential and suitable LPC habitat. Implementation would result in greater viability risks to the LPC and may result in Federal listing. | Suitable habitat = 90−96 percent (17,010−18,140 acres) of the vegetation type. Desired vegetation structure and species composition would enhance habitat by reducing the presence of undesirable trees. LPC mortality caused by collision with fences would be reduced. Under Alternatives B and C, there would be no loss of viability or trend toward future listing. | |
| Lesser Prairie-chicken on sand sagebrush | Suitable habitat ≤100 percent (≤22,650 acres) of the vegetation type.<br>Due to no defined targets for vegetation structure and species composition, this alternative would produce uncertain outcomes. | Suitable habitat = 100 percent (22,650 acres) of the vegetation type.<br>Implementation would move this vegetation type toward desired vegetation structure and species composition, accomplished through well-defined targets for this vegetation type, improving LPC habitat. | |
| Black-tailed prairie dog on sand sagebrush | Suitable habitat = 1−10 percent (230−2,300 acres) of the vegetation type.<br>Due to no defined targets for vegetative structure and species composition, this alternative would produce uncertain outcomes. | Suitable habitat = 1−10 percent (<230−2,300 acres) of the vegetation type.<br>Implementation would move this vegetation type toward desired vegetation structure and species composition, thereby reducing BTPD expansion. | |
| Black-tailed prairie dog and Mountain Plover on shortgrass prairie | Suitable habitat would range from about 30-32 percent (54,570−58,210 acres) of the vegetation type. The expansion of BTPD colonies would result in increased areal extent of early successional stage shortgrass prairie, thus increasing nesting/foraging areas for Mountain Plover. | | |
| Swift fox on shortgrass prairie | Suitable habitat = 100 percent (181,900 acres) of the vegetation type. The expansion of BTPD colonies would result in an increased prey base for the swift fox. | | |
| | | Predation on swift fox would be reduced by installation of artificial escape structures. | |
| Plains leopard frog on playa lakes | Suitable habitat = 100 percent (1,820−5,460 acres) of this fluctuating habitat.<br>Improved habitat in and around the playa inclusions would result from restoration of altered playa basins. | | |

**Consequences Comparison by Alternative**

| Environment | Alternative A | Alternative B | Alternative C |
|---|---|---|---|
| Plains leopard frog on cottonwood-willow riparian excluding Canadian River | Suitable habitat would be ≤100 percent (≤ 1,370 acres) of the vegetation type.<br>Implementation would have no defined targets for riparian species composition or structure. This may degrade the habitat of the riparian community for plains leopard frog. | Suitable habitat would be equal to 100 percent (1,370 acres) of the vegetation type.<br>Habitat would be improved by moving toward a defined structure and composition outcome by focusing on early seral stage development and by increasing snags and woody debris in the streambeds and riparian area. | |
| Plains leopard frog on cottonwood-willow riparian on Canadian River | Suitable habitat ≤100 percent (≤1,500 acres) of the vegetation type.<br>Implementation would have no defined targets for riparian species composition or structure. This may degrade the habitat of the riparian community for plains leopard frog. | Suitable habitat = 100 percent (1,500 acres) of the vegetation type.<br>Habitat would be improved by moving toward a defined structure and composition outcome by focusing on early seral stage development and by increasing snags and woody debris in the streambeds and riparian area. | |
| **International Migratory Bird Act** | | | |
| | There would be no direction for desired vegetation structure and species composition in all vegetation types. | Fine filter plan components in objectives and guidelines for grassland restoration in vegetation and habitat associated with species that have viability high at-risk concerns would support migratory bird habitat. | |
| **Bald and Golden Eagle Protection Act** | | | |
| | There would be no programmatic take of eagles under any of the alternatives. | | |
| **Management Indicator Species** | | | |
| Rio Grande Turkey on mixed hardwood riparian | Suitable habitat = 50−100 percent (975−1,950 acres) of the vegetation type.<br>More intense and hotter fires caused by fuels buildup from lack of planned fire would reduce the number of mature deciduous trees, thereby eliminating roost areas for the Rio Grande Turkey. | Suitable habitat = 100 percent (1,950 acres) of the vegetation type.<br>Mixed hardwood riparian vegetation type would move toward defined targets for species composition and structure, thereby improving habitat for the Rio Grande Turkey by providing roosting trees, foraging areas, and nesting and brood-raising areas in the early and mid-successional stages. | |
| Burrowing Owl on shortgrass prairie, early successional stage | Suitable habitat = about 30−32 percent (54,570−58,210 acres) of the vegetation type. | | |
| | There would be no direction for desired vegetation structure and species composition that would enhance habitat for Burrowing Owl. | Targets for desired vegetation structure and species composition would result in BTPD colony expansion, thus improving habitat for Burrowing Owl. | |

**Consequences Comparison by Alternative**

| Environment | Alternative A | Alternative B | Alternative C |
|---|---|---|---|
| Mountain Bluebird on pinyon-juniper | Suitable habitat = about 90 percent (19,530 acres) of the vegetation type.<br>Habitat could be reduced or degraded because there are no defined targets for vegetation structure. | Suitable habitat = 100 percent (21,700 acres) of the vegetation type.<br>Implementation would improve habitat by increasing the diversity of structural stages. | |
| Invasive plants and animals | Shelterbelts would be maintained, thereby providing a source of invasive tree seed. | Invasive plant and animal species would be controlled according to management direction, allowing vegetation types to move toward desired vegetation structure and species composition. | |
| Climate change | No major differences among alternatives. | | |
| **Needs for Change Issue: Managed Recreation** | | | |
| Scenery | Would place less emphasis on retaining visual quality and is silent on effects of wind energy development on scenery. | Would assign HSI to Lake Marvin, Lake McClellan, Mills Canyon, Sauz Creek, Sugar Loaf Mountain, Santa Fe National Historic Trail, the High Lonesome, and around most developed recreation sites. Would emphasize retaining visual quality including guidance for wind energy development with respect to scenery. | |
| Visual Quality Objectives/ Scenery Management System | Partial retention for 12,286 acres and modification for 251,668 acres. | High scenic integrity objective for 83,011 acres; moderate for 139,879 acres; and low scenic integrity objective for 40,705 acres. | |
| Recreation Opportunity Spectrum | Limited ROS classes allow less flexibility for recreation planning.<br>There would be 165,525 acres semiprimitive motorized, and 98,429 acres roaded natural. | Changes in ROS would better characterize the recreation experience and increase latitude in recreation planning; 1,445 ac. Rural; 4,752 ac. RN; 248,711 ac. SPM; 8,121 ac. SPNM. | There would be 8,212 acres semiprimitive nonmotorized; 248,650 acres semiprimitive motorized; 4,722 acres roaded natural; and 1,445 acres rural. |
| Dispersed and motorized | Does not address dispersed uses other than motorized on the Grasslands. | Would restrict dispersed camping around historic sites, interpretive sites, most trailheads, and stock water tanks. | Same as alternative B, except motorized use would be prohibited in the PWA. Back-country uses would replace motorized uses. |
| Developed | Prescribes new and unneeded construction, reconstruction, increased capacity at Lake Marvin, Lake McClellan, and unspecified areas on KRB. | Reconstruction of existing sites would provide recreation opportunities responsive to visitor demand. | |
| Recreation suitability | Recreation suitability acreage does not vary by alternative; 261,256 acres are suitable for developed and/or dispersed recreation. | | |
| Nature-based tourism | Would not actively promote ecotourism and associated economic development. | Would encourage partnerships and visitation to important bird areas and other wildlife viewing activities. | |

**Consequences Comparison by Alternative**

| Environment | Alternative A | Alternative B | Alternative C |
|---|---|---|---|
| Heritage resources | No major differences among alternatives. | | |
| **Special Areas — Areas of Interest** | | | |
| Scenic byways and Santa Fe National Historic Trail | Provides no guidance. | Would provide design guidelines for structural developments and enhance visitor experience. | |
| RNAs | No major differences among alternatives. No RNAs recommended. | | |
| Canadian Eligible Scenic River | No major difference among alternatives. All alternatives would protect scenic values in the Canadian River corridor. No alternative would recommend designation. | | |
| Wilderness | Would not recommend wilderness. | Would not recommend wilderness. Would conserve wilderness characteristics. | PWA boundary contains 6,028 total acres; 5,444 are Kiowa NG and 584 are State Trust lands. |
| **Needs for Change Issue: Human Influences** | | | |
| Roads and access | No major differences among alternatives. | | |
| Land adjustments | No major differences among alternatives. | | |
| Minerals and energy development | Minerals and energy development would be conducted in accordance with law, regulation, policy, and through the use of BMPs. | These alternatives would be similar to alternative A but include additional BMP associated guidelines that would benefit the environment. | |
| Special forest products | Nonnative, invasive trees (except in shelterbelts) would be removed, potentially providing forest products. | Undesirable, native and nonnative trees (including shelterbelts) would be removed, providing more forest products than alternative A. | This alternative would be similar to alternative B except that tree removal could be limited in the potential wilderness area. |
| Timber suitability | There are no lands on the Grasslands that are suitable for timber production; they are either nonforested, would be subject to irreversible resource damage, or are not cost efficient in meeting forest objectives. Thus, there is no difference among alternatives with respect to timber suitability, long-term sustainable yield calculations, or allowable sale quantity. | | |
| Allowable sale quantity | | | |
| Long-term sustainable yield | | | |
| Special uses | No major differences among alternatives. | | |

**Consequences Comparison by Alternative**

| Environment | Alternative A | Alternative B | Alternative C |
|---|---|---|---|
| Wind energy development | All wind development project proposals would be subject to Forest Service directives and NEPA analysis wherein project-specific environmental consequences would be evaluated. | Similar to alternative A, except guidelines would require ½ mile buffer from developed recreation and 500 feet from sites that are listed or eligible for inclusionon the National Register of Historic Places. | |
| Livestock use | Would convert 4,400 acres of shinnery oak to grassland/livestock use. Would prescribe unneeded, project-specific range developments. | Would not convert shinnery oak habitat to grassland. Would allow, but not prescribe, project-specific range developments. | |
| Grazing suitability | Grazing suitability does not vary by alternative (255,541 acres full capacity; 6,953 acres potential capacity). | | |
| Wildland-urban interface and fire management | No major differences among alternatives. | | |
| **Socioeconomic Values** | | | |
| Present net value | $152,409,164 | $151,130,674.<br>The difference from alternative A is due to slightly higher costs projected for vegetation restoration under alternatives B and C. | |
| Labor income generated | $7,217,000 | Unknown. Difference is not expected to be economically significant. | |
| Jobs contributed (all industry sectors) | 154 jobs. No difference among alternatives. | | |

Where table 3 (above) focuses on environmental consequences, table 4 (below) presents a qualitative assessment of how desired conditions would be met.[7] The reader should note that the environmental consequences of the respective alternatives upon the physical, biological, or social resources of the Grasslands (table 3) do not necessarily equate with the likelihood of the respective alternatives meeting desired conditions (table 4) that were crafted to address the collaboratively identified needs for change to the 1985 plan.

[7] Desired conditions were developed collaboratively with the public during the plan development process; alternatives B and C were developed to meet those desired conditions. Desired conditions for alternatives B and C differ only for the potential wilderness area issue.

**Table 4. Summary of the likelihood of each alternative achieving desired conditions**

| Likelihood of Achieving Desired Conditions by Alternative | | | | | |
|---|---|---|---|---|---|
| **Resource Area** | **Not Likely** | ← | | | **Highly Likely** → |
| Soil, Water, Air | | | A | | B<br>C |
| Vegetation | A | | | B<br>C | |
| Federally Listed Species | | | | | A<br>B<br>C |
| Species with Viability Risks | A | | | | B<br>C |
| Management Indicator Species | | A | | | B<br>C |
| Invasive Plants and Animals | A | | B<br>C | | |
| Climate | | | | | A<br>B<br>C |
| Scenery | A | | | B<br>C | |
| Recreation | | A | | | B<br>C |
| Nature-based Tourism | A | | | | B<br>C |
| Heritage Resources | | | | | A<br>B<br>C |
| Special Areas | | | | A | B<br>C |
| Wilderness | A | B | | | C |
| Roads and Access | | | | A<br>B<br>C | |
| Land Adjustments | | | | A<br>B<br>C | |
| Minerals and Energy Development | | | A | B<br>C | |

| Likelihood of Achieving Desired Conditions by Alternative | | | | | |
|---|---|---|---|---|---|
| **Resource Area** | **Not Likely** | ← | | | **Highly Likely** → |
| Special Forest Products | | | A | B<br>C | |
| Special Uses | | | | A | B<br>C |
| Wind Energy Development | | | | A | B<br>C |
| Livestock Use | | | | | A<br>B<br>C |
| Wildland-Urban Interface and Fire Management | | | | A<br>B<br>C | |

## Timber Suitability, Long-Term Sustainable Yield Calculations, and Allowable Sale Quantity

There are no lands on the KRB and BKMC NGs that are suitable for timber production. Lands of these national grasslands are either nonforested, would be subject to irreversible resource damage, or are not cost efficient in meeting forest objectives. Thus, there is no difference among alternatives with respect to long-term sustainable yield calculations or allowable sale quantity.

# Chapter 3. Affected Environment and Environmental Consequences

This chapter summarizes the physical, biological, social, and economic environments of the management areas and the consequences of implementing each alternative on that environment. It also presents the scientific and analytical basis for the comparison of alternatives presented in chapter 2 and is organized by needs for change issues, similar to the organization of chapter 2.

The land management plan provides a programmatic framework that guides site-specific actions but does not authorize, fund, or carry out any project or activity. Because the land management plan does not authorize or mandate any site-specific activities or ground-disturbing actions, there can be no direct effects. However, there may be implications—or longer term environmental consequences—of managing the Grasslands under this programmatic framework.

For estimating the environmental consequences at the programmatic Grasslands plan level, the assumption has been made that the kinds of resource management activities allowed under the plan direction of the preferred alternative are reasonably foreseeable future actions to achieve the desired conditions and objectives. However, the specific location, design, and extent of such activities are generally not known at the time. Those decisions are made on a site-specific (project-by-project) basis. Therefore, the discussions here refer to the potential for consequences to occur and are in many cases only estimates. The consequences analyses are useful when comparing and evaluating alternatives on a Grasslands-wide basis, but are not intended to be applied directly to specific locations on the Grasslands.

In addition to assessing environmental consequences of the alternatives upon the Grasslands resources, goods, and services, an analysis is made of cumulative consequences that may occur from actions outside of Federal lands. Cumulative consequences are deemed to occur and are addressed below when those actions outside of the Grasslands boundaries interact with plan management on the Grasslands.

An interdisciplinary approach was used to evaluate possible environmental consequences for the alternatives addressed in this report. A matrix was developed and used that prompted review of the plan components for each resource area by alternative and is presented in appendix J. This examination revealed whether implementation of any given alternative might have important positive or negative consequences for attaining the desired conditions for each resource area.

## Needs for Change
## Topic 1: Ecosystem Diversity

Components of the physical and biological environment combine with management practices to shape the variety of habitats or ecosystems within a landscape. The FPEIS examines the effects of the plan alternatives on these components.

To determine consequences of the alternatives, a discussion of the affected environment of the soils, air, watershed features, vegetation, wildlife habitat associations, invasive species, and climate on the Grasslands is presented below. Following the discussion of the affected environment of these resources, the anticipated environmental consequences of the alternatives upon each of these resources are presented. Cumulative consequences from actions outside the Grasslands borders are also anticipated. The reader is referred to the referenced specialist reports for more detail on the analyses leading to a conclusion of what the consequences may be.

The reader should understand that even though alternative A would have no plan direction on certain issues (e.g., climate change, invasive species) that are addressed with plan direction by the other alternatives, the laws, regulations, and policy (such as the Clean Water Act, Clean Air Act, and Endangered Species Act) currently in place regarding those issues forms the basis of comparison of alternative A to the other alternatives.

## Soils

Section 1502.2(b) of the National Environmental Policy Act provides for discussion of impacts in proportion to their significance. The environmental consequences in this section focus on the components of the soil resource that are useful to the decision maker and the public. Additional information is in the "Soils Specialist Report" (USDA Forest Service 2011a).

### Affected Environment

As of 2011, much of the current soil condition is an artifact of Dust Bowl era erosion and deposition. Soils in the old fields that were in cultivation prior to the Dust Bowl were severely eroded, with most or all of the topsoil removed through wind erosion. These changes significantly altered soil structure, stability, and texture. Soil fertility in these areas is very low, and both microorganisms and organic material are present in the soil in very limited quantities. Most soils degraded in the Dust Bowl era have not yet developed into the productive grassland soils found before the 1930s.

As of the most recent soil survey (2005), 90 percent of the Grasslands have soil loss rates either equal to or below the predicted natural soil loss potential (the predicted soil loss under natural conditions). Soil loss rates for 10 percent of the soils exceed the predicted natural soil loss potential; however, this is a natural state for these soils (shortgrass and mixed-grass prairie). In addition, smaller localized areas occur that may exceed the tolerable soil loss rate[1]. These areas occur in all of the vegetation types and are associated with roads, off-road vehicles, areas where livestock congregate, recreation, oil and gas developments, and caliche extraction pits.

Soil condition is an evaluation of soil quality based on an interpretation of factors which affect vital soil functions of hydrology, stability, and nutrient cycling.[2] Fifty-two percent of the

[1] The tolerable soil loss rate is the rate of soil loss that can occur while sustaining inherent soil productivity.

[2] Soil condition is classified as:

*Satisfactory*. Indicators signify that soil function is being sustained and soil is functioning properly and normally. The ability of the soil to maintain resource values and sustain outputs is high.

*Impaired.* Indicators signify a reduction in soil function. The ability of the soil to function properly and normally has been reduced and/or there exists an increased vulnerability to degradation. An impaired category indicates there is a need to investigate the ecosystem to determine the cause and degree of decline in soil functions. Changes in land management practices or other preventative measures may be appropriate.

*Unsatisfactory.* Indicators signify that a loss of soil function has occurred. Degradation of vital soil functions result in the inability of the soil to maintain resource values, sustain outputs or recover from impacts. Unsatisfactory soils are candidates for improved management practices or restoration designed to recover soil functions.

*Inherently Unstable.* These soils have natural erosion exceeding tolerable limits. Based on calculations Hillslope Erosion Model these soils are eroding faster than they are renewing themselves but are functioning properly and normally.

Grasslands soils are satisfactory, and 48 percent are impaired. No soils on the Grasslands are inherently unstable or in unsatisfactory condition (table 5).

**Table 5. Soil condition of the Black Kettle, McClellan Creek, Kiowa, and Rita Blanca National Grasslands**

| Vegetation Type | Soil Condition | | Total |
|---|---|---|---|
| | Satisfactory | Impaired | |
| Mixed-grass prairie | 93% | 7% | 4.3% |
| Shortgrass prairie | 54% | 46% | 69.5% |
| Shinnery oak | 15% | 85% | 7.3% |
| Pinyon-juniper | 76% | 24% | 8.9% |
| Cottonwood-willow | 100% | 0% | 0.5% |
| Mixed hardwood riparian | 100% | 0% | 0.7% |
| Sand sagebrush | 26% | 74% | 8.6% |
| **Total Percent of Grassland Area** | **52%** | **48%** | **100%** |

Restoration management practices on the Grasslands over the past several decades have resulted in tremendous improvement in soil stability and vegetative recovery. A few units on the BK NG that were plowed in the past may not recover to their pre-Dust Bowl productivity, but they are vegetated and stabilized. BTPD colonies cover about 9,500 acres (3,800 acres occupied in 2011) of the KRB NGs. Currently occupied colonies are largely devoid of vegetation and may be prone to wind, sheet, and rill erosion.

Windblown sand originating from adjacent agricultural land is deposited on the Grasslands, sometimes accumulating to depths of 5 feet. The Environmental Quality Incentives Program (EQIP) and the Conservation Reserve Program (CRP)—voluntary conservation programs administered by the USDA Natural Resources Conservation Service—provide farmers and ranchers with technical and financial assistance to reduce erosion. EQIP reduces soil erosion and sedimentation from unacceptable levels on agricultural land. CRP reduces soil erosion by converting highly erodible cropland or other environmentally sensitive acreage to vegetative cover. Some Grasslands permittees use EQIP and CRP assistance on their Federal allotments and their adjacent private land.

## Environmental Consequences

*Common to All Alternatives.* Where not specifically directed by the plan, soil condition would be maintained or improved according to law, regulation, and policy and through the use of BMPs and adaptive management. Such practices reduce soil erosion by maintaining adequate vegetative cover of areas grazed by livestock and by rehabilitating defunct oil and gas drilling pads and associated roads. Occupied BTPD colonies would remain susceptible to soil erosion. Soil erosion may increase in the short term where fire hazard is reduced by thinning or prescribed burning.

*Alternative A.* Potential long-term soil erosion would be reduced on 50.8 miles of road that would be obliterated[3] within the first 10 years of plan approval.

*Alternatives B and C.* All unauthorized routes and decommissioned roads where resource damage is occurring would be rehabilitated within the first 15 years of plan approval. Shinnery oak vegetation types would move toward desired vegetation structure and species composition, thus reducing soil erosion by stabilizing impaired soils within those vegetation types. Tools like spreader dams would be used to reduce soil removal by gullying. Removal of undesirable trees on 1,000 to 2,000 acres within 10 years of plan approval may result in increased soil erosion during the period between tree removal and reestablishment of ground cover.

### Cumulative Environmental Consequences

The cumulative effects area is the Grasslands and adjacent private land (within about 1 mile).

Soil removal, transport, or deposition by wind, water, or air would be reduced on the Grasslands through EQIP and CRP supported activities in the cumulative effects area.

## Water

Section 1502.2(b) of the National Environmental Policy Act provides for discussion of impacts in proportion to their significance. The environmental consequences in this section focus on the components of the water resource that are useful to the decision maker and the public. Additional information is in the "Watershed Specialist Report" (USDA Forest Service 2011b).

### Affected Environment

*Watersheds, Streams, and Riparian Areas.* The Grassland units are located within 26 discrete watersheds. Most of the Grasslands fall within 8 of the 26 watersheds. The ESR (pages 11–13) lists the watersheds including acres, percent ownership, percent of streams by stream type in each watershed, and percent of the acreage of lakes and ponds in each watershed. There are many different kinds of surface water features in the Grassland units. These include streams, reservoirs and lakes, playa lakes, and wetlands. Groundwater is also an important part of Grasslands water resources. Watershed conditions upstream of the Canadian River Mills Canyon MA are degraded.

There are 409.5 miles of stream channels on the Grassland units. New Mexico has 234.8 miles, 137.6 miles are in Oklahoma, and 37.1 miles are in Texas. Of these, 33.2 miles flow continuously and are perennial. New Mexico has 19.8 miles of perennial streams, 11.5 miles are located in Oklahoma, and 1.8 miles are in Texas. Watershed conditions upstream of the Canadian River Mills Canyon MA are degraded. In Texas, below Lake Meredith, Coldwater Creek and Rita Blanca Creek are mostly intermittent tributaries of the Canadian River. McClellan Creek from the confluence with the North Fork of the Red River upstream to the Lake McClellan dam is classified with a high aquatic life use based on its perennial flow.

There are 5,003 acres of riparian areas as calculated using TEUI data (Strenger et al. 2007). The Canadian River flood-prone area in the Mills Canyon MA of the Kiowa NG comprises 894 acres of the riparian total; 2,980 acres are located on the KRB MA while 2,023 acres are located on the BKMC MA. The 17 miles of the Canadian River that flow through the Mills Canyon MA are

[3] Alternative A defines "obliterate" as the action needed to close an unneeded road and return the land to production.

degraded from saltcedar invasion, and lack of down woody debris in the riparian area and stream channel (Haan and Thornton 2004). There are numerous roads and trails along and across the river created by visitors to Mills Canyon .

Watershed conditions upstream of the Canadian River Mills Canyon MA are degraded and likely affecting the reaches of the Canadian River on the Grasslands primarily through increased sedimentation. Upstream water diversion has altered seasonal base flows in the Mills Canyon portion of the Canadian River, thereby reducing water availability for adjacent riparian area vegetation.

*Reservoirs and Lakes.* On the Grasslands, reservoirs and lakes are mostly associated with dams or berms designed to pond water behind them. Lake Marvin, Lake McClellan, Skipout Lake, Spring Creek, and Black Kettle Recreation Area are the major surface waters located in Texas and Oklahoma within the Grassland units.

*Playas.* There are 113 playas and alkali lakes located on the Grassland units. Texas and New Mexico account for 59 and 51 of these respectively. The remaining three are located in Oklahoma.

*Wetlands.* Wetlands occur throughout the Grasslands as small saturated areas. Palustrine emergent wetlands occur in the Sauz Creek watershed of the Kiowa MA.

*Groundwater.* The High Plains aquifer system covers the plains portions of eight states (CO, KS, NE, NM, OK, SD, TX, and WY) and includes parts of all four Grasslands (McGuire 2004). Within the Grasslands administrative boundary, about 1,500 water wells (80 percent) are on state and private land and 380 water wells (20 percent) are on FS managed land. Most of the Grasslands are on the Ogallala aquifer, except for the Mills Canyon portion of Kiowa NG which is over the Canadian River aquifer and a small portion of BK units over the Washita Alluvium aquifer. There is minimal data available on the conditions of the smaller aquifers, but data on the Ogallala aquifer indicates that it has experienced extreme drawdown over the last 50 years (McGuire 2004). Pumping water for irrigation, municipal water supplies, and other uses far exceeds the recharge ability of the aquifer (McGuire 2004).

*Water Quality and Condition.* All of the watersheds in the Grasslands units were assessed as being in Class II Condition using the current direction found in FSM 2521.1. This means these watersheds exhibit moderate geomorphic, hydrologic, and biotic integrity relative to their natural potential condition.

General water quality standards in Texas, Oklahoma, and New Mexico, where the Grasslands occur, apply to all waters and standards linked to designated uses of the waterbody, whether it is a stream, lake, or pond. Currently water quality on the Grasslands is relatively good. Of the about 51 miles of the Washita River that run in the BK NG's administrative boundary, less than 2 miles go through Grasslands units. The Washita River is on the most recent list of water quality impaired streams in Oklahoma. Those reaches of the Washita are below water quality standards for pathogens (*Escherichia coli*, *Enterococcus* spp., and fecal coliform), sulfates and turbidity (Oklahoma Department of Environmental Quality 2004). The water quality in the reservoirs on the BK NG is not tested by the Forest Service, but none are on the impaired water lists for New Mexico, Oklahoma, or Texas. Drinking water meets water quality standards.

Currently, camping units in the Mills Canyon MA are located away from the flood plain and there are 40 to 50 miles of roads in riparian areas on the Grasslands that include unauthorized user-created roads located along streams and in riparian areas. Livestock permits are unobligated on the largest riparian unit (K-91), and grazing is limited in other parts of the riparian area (K-136, K-135, and K-87). Saltcedar control treatments are ongoing in the riparian areas.

## Environmental Consequences

### Watersheds, Streams, and Riparian Areas

*Common to All Alternatives.* Evapotranspiration of the instream flow would be reduced by removal of saltcedar, and enhancement of riparian habitat on the Canadian River would be accomplished by restoration of native species within the Mill Canyon MA.

*Alternative A.* Implementation would not improve or maintain to a proper functioning condition (PFC) because this alternative has no provisions for attaining PFC in all wetlands, playas, permanent and intermittent streams, and riparian areas. The consequences of not having provisions for PFC would be a lack of attention to and management for the stream characteristics listed under alternatives B and C below.

*Alternatives B and C.* Implementation would improve or maintain all wetlands, playas, permanent and intermittent streams, and riparian areas in a PFC represented by stream characteristics (including vegetation, woody debris, geomorphology, and hydrology) that are sufficient to:

- Dissipate stream energy associated with high waterflows, thereby reducing erosion and improving water quality.
- Capture and store sediment and aid in vertical and lateral channel stability, thereby increasing flood plain development, habitat development, and species richness.
- Improve floodwater retention, thereby increasing groundwater recharge and sustaining riparian habitat.

Implementation would further reduce sediment discharge into streams, lakes, or wetlands and stabilize drainage networks by restricting or mitigating damage from off-highway-vehicle use in aquatic systems. These alternatives would also maintain river connectivity at road crossings during low flows. Similarly, these alternatives would reduce trampling and erosion by livestock and increase protection of natural springs and associated habitat and water quality.

Restoration of altered playa basins would allow longer presence and larger areal extent of surface water on playas.

*Alternative C.* Implementation would reduce sediment discharge from motorized trail use into the Canadian River and its tributaries within the wilderness by nature of the fact that those trails would be closed to motorized activity. Disturbance to wildlife would also be reduced.

### Groundwater

*Common to All Alternatives.* Minor aquifer drawdown due to continued use of water for livestock and wildlife watering from the 380 wells on the Grasslands units would contribute to groundwater depletion.

## Cumulative Environmental Consequences

The cumulative consequences area of consideration is the riparian and surface water features upstream and downstream of the Grasslands boundaries that are connected to the riparian and surface waters within the Grasslands.

### Watersheds, Streams, and Riparian Areas

*Cumulative Consequences Common to All Alternatives.* Programs implemented through U.S. Department of Agriculture Natural Resources Conservation Service (NRCS), the U.S. Environmental Protection Agency (EPA), and state and local agencies to improve conditions to riparian and surface water features upstream and downstream on non-Federal lands foster activities that have cumulative environmental consequences in conjunction with Grasslands alternatives. For example, the interagency Canadian River saltcedar control program efforts upstream and downstream of the Mills Canyon area would reduce evapotranspiration of the instream flow and enhance riparian habitat on the Canadian River within Mills Canyon. Similarly, landowner assistance programs that address water quality, sedimentation, floodwater retention, and streambank stabilization upstream of the Grasslands, would result in gradual riparian and surface water improvements of Grasslands managed areas.

*Cumulative Consequences to Alternatives B and C.* Off-Grasslands landowner assistance programs would accelerate restoration of desirable stream characteristics on the Grasslands in concert with the emphasis on PFC in these alternatives. Management of streams and riparian areas upstream of the Grasslands on non-Federal land is generally not conducted with emphasis on PFC; therefore, the streams within the Grasslands would become that much more important to the overall health of the watershed.

### Groundwater

*Common to all alternatives but only affecting the shortgrass prairie and sand sagebrush vegetation types on the KRB NGs.* Groundwater used for cropland irrigation on nearby private lands contributes to aquifer drawdown. This could result in shallower wells on the Grasslands drying up, thereby reducing the capability for using livestock on the Grasslands as a tool to approximate natural disturbance processes. Higher fuel loads may also result, with accompanying likelihood of unplanned ignitions and intense wildfire.

## Air

Section 1502.2(b) of the National Environmental Policy Act provides for discussion of impacts in proportion to their significance. The environmental consequences in this section focus on the components of the air resource that are useful to the decision maker and the public. Additional information is in the “Air Resources Specialist Report” (USDA Forest Service 2011c).

## Affected Environment

Of the three states that contain the Grasslands, only New Mexico has identified airsheds. Texas and Oklahoma reference their air quality based on the county or on descriptions of nonattainment or maintenance areas.

The Kiowa NG is located within the Canadian River Airshed, as defined by the New Mexico Environment Department’s Smoke Management Program. Based on the EPA’s 2010

nonattainment designations for the six criteria pollutants, the counties within the Canadian River Airshed are in attainment for all six pollutants (ground-level ozone, particulate matter pollution at 2.5 and 10 micrometers, lead, carbon monoxide, sulfur dioxide, and nitrogen oxides). The BK, MC, and RB NGs are split between Texas and Oklahoma. The associated counties covering these NGs are in attainment for all six pollutants.

The regional emissions data were obtained from the EPA's AirData Web site for the year 2002 and from the National Emissions Inventory (NEI) for the year 2008. Based on emissions data from 2002 to 2008, the overall trend was a decrease in all criteria air pollutants measured (excludes ozone and includes volatile organic compounds) in the four counties covering the Kiowa NG. The projected trend out to 2018, using the Forest Service's Emissions Tool11, indicates a continued decrease in criteria pollutant emissions except for particulate matter $PM_{10}$ and $PM_{2.5}$. It is not clear at this time why there are slight increases for particulate matter, but these increases are slight and do not exceed National Ambient Air Quality Standards (NAAQS) or state standards. To date there have been no documented exceedances of the NAAQS due to national grasslands activities. This trend is expected to continue over the next 5 to 10 years.

Based on emissions data from 2002 to 2008 from the EPA AirData tool and the NEI, the overall trend was a decrease in all criteria pollutants except a small increase in sulfur dioxide emissions and large increase in volatile organic compounds (VOCs) in the five counties covering the BKMC and RB NGs. From 2002 to 2008, the VOCs doubled due to large increases in emissions in Hemphill County in Texas and Roger Mills County in Oklahoma, both of which comprise the BK NG. The increase in emissions in 2008 can be attributed to petroleum and related industries. Although VOCs are not currently regulated by the EPA, they do react with nitrogen oxides to form ozone, which is an EPA regulated criteria pollutant. Even with the doubling of VOC emissions in Hemphill County, it is still in attainment for ozone.

In general, the projected trend out to 2018 using the Forest Service's Emissions Tool11 shows decreases in the criteria pollutant emissions. Increases in nitrogen oxides in Roger Mills County, Oklahoma, and carbon monoxide and sulfur dioxide in Gray County, Texas, are predicted. There are also projected increases in ammonia and VOCs, which may be due to further increases in oil and gas development or higher levels of urbanization in these counties. There have been no documented violations of the NAAQS in the counties the BKMC or RB NGs cover due to Grasslands activities. This trend is expected to continue over the next 5 to 10 years.

Emissions from activities on and off the Grasslands include emissions from vehicles, dust from unsurfaced roads, cropland, construction sites, bare ground, campfires, prescribed fire, wildfire, and oil and gas developments. Oil and gas developments are regulated for emissions and required to have emission controls in all three states. Emissions related to fire are regulated through state smoke management plans. Emissions from vehicles, dust, and campfires are not monitored, and there is no way to know the effect, range, or variation in these emissions. Prescribed fire is the most notable land management activity that takes place on the Grasslands that has implications on air quality; however, this has not contributed to long-term adverse air quality. All projects, including prescribed burns, must meet state air quality standards and smoke management plans once finalized.

### Environmental Consequences

*Common to All Alternatives.* Air quality on the Grasslands is regulated under individual state air quality standards and subject to their individual smoke management plans. Air quality, thus, would be expected to be in attainment for the six criteria pollutants.

### Cumulative Consequences

The cumulative consequences area for this resource is essentially undefinable as particulate matter and pollutants have been documented to travel long distances and are dispersed non-uniformly, based on weather and other environmental factors.

*Common to All Alternatives.* Blowing, fugitive dust from adjacent lands or nearby lands that have been cultivated, or from unpaved county roads, construction sites, bare ground, or smoke could have temporary consequences to air quality over the Grasslands and temporarily suspend management activities on the Grasslands until attainment conditions return.

## Vegetation

### Introduction

On the Grasslands, vegetation types occur across the landscape with variable elevation, landforms, soil depth, and erosion characteristics. These characteristics, along with management, determine vegetation structure, composition, habitat, and presence of associated species. Seven major vegetation types occur on the Grasslands, together with some minor inclusions such as playa lakes, and unique habitat such as rivers and aquatic and riparian habitats. All vegetation types on the Grasslands are in low departure from reference condition for vegetation structure. A vegetation type is considered in low departure if it does not exceed 33 percent in departure from the reference condition for vegetation structure (see the Web address provided in appendix B).

The reference condition of vegetation structure was a primary factor used to determine ecological sustainability and to do the risk assessment for a species' viability. Reference condition represents an approximation of the vegetation structure when all historical ecological functions and processes were in place.

Section 1502.2(b) of the National Environmental Policy Act provides for discussion of impacts in proportion to their significance. The consequences in this section focus on the components of vegetation types, habitat, and wildlife that are useful to the decision maker and the public. Additional information is in the "Vegetation and Wildlife Specialist Report" (USDA Forest Service 2011X) in the plan set of documents.

### Affected Environment

#### Mixed-grass Prairie Vegetation

Mixed-grass prairie covers about 35 percent (11,300 acres) of the BKMC NGs. The mixed-grass prairie on the red-shale soils is dominated by perennial grasses, including blue grama, hairy grama, little bluestem, and purple threeawn. About 80 percent of the species composition is grass; forbs make up about 10 percent, and about 10 percent are woody species located in planted windbreaks as well as scattered groves of invasive native and nonnative trees.

In addition, there are about 12 linear miles and 156 acres of treed Dust Bowl era planted shelterbelts on the BK NG, many of which are within this vegetation type. Erosion control shelterbelts were introduced to curtail erosion and in most areas have completed that function as grassland vegetation has been reestablished.

Tree species planted in windbreaks and shelterbelts include native black locust, Osage orange, eastern redcedar, green ash, cottonwood, and honey locust. Nonnative species include some pine species and Siberian elm. Native and nonnative trees in the shelterbelts, windbreaks, and scattered groves would not normally be found in the mixed-grass prairie vegetation type and are considered undesirable invasive species.

Woody species and trees encroach onto the mixed-grass prairie in the absence of fire. Several species chosen for the windbreaks and shelterbelt areas are prolific and invasive, such as native black locust and eastern redcedar, and nonnative Siberian elm. These undesirable invasive species have dispersed over the landscape and altered mixed-grass prairie structure and composition. Planned fire and managed livestock grazing/browsing are used as tools to move this vegetation type toward desired vegetation structure and species composition.

Mixed-grass prairie on the BKMC NGs is in low departure from reference condition for vegetation structure. In contrast, this vegetation type on non-Federal land is highly departed from its reference condition for vegetation structure due to historical agricultural practices and land use.

In 2008, there was more grass dominated prairie on the landscape in proximity of the BKMC NGs, than was present historically, largely due to eradication of shinnery oak on private lands.

#### Shinnery Oak Vegetation

The shinnery oak shrub vegetation type on the BK NG is in low departure (25 percent) from reference condition for vegetation structure, mainly due to undesirable tree encroachment. This vegetation type covers about 59 percent (18,900 acres) of the BK NG. It is a very underrepresented vegetation type across the Southern Great Plains landscape due to conversion of this type to other uses and types on non-Federal lands. About 45 percent of the shinnery oak vegetation is in the early to mid-open, postfire to 3 years postfire regime and dominated by tall grasses in shallower and more stable sandsheet areas. Grass cover is dominant in the early to mid-open stage with rapid recovery of shinnery oak resprouts. The late-closed successional stage occurs in the 3- to 10-year postfire timeframe. Shinnery cover is mostly dominant, although grasses remain codominant on about 55 percent of the vegetation type. Uncharacteristically tall hybrid tree/shrubs of shinnery and post oak occur in some motts.

Similar to mixed-grass prairie, planted, Dust Bowl era treed shelterbelts, planted windbreaks, and scattered groves of trees—not normally found in shinnery oak vegetation types—occur. Several species chosen for the windbreaks and shelterbelt areas are prolific and invasive, such as native black locust and eastern redcedar, and nonnative Siberian elm.

Woody species and trees encroach onto the shinnery oak vegetation in the absence of fire and alter the structure and composition of this vegetation type. Planned fire and managed livestock grazing/browsing are used as tools to move this vegetation type toward desired vegetation structure and species composition. Most shinnery oak stands are burned on a 2- to 9-year cycle to maintain a codominant canopy cover of grasses intermixed with shinnery oak for wildlife habitat

diversity and to resemble historical conditions. Current livestock grazing within the shinnery oak system is relatively light, with utilization levels retaining at least 50 percent of the current year's growth of vegetation, by weight, of forage species.

### Mixed Hardwood Riparian Vegetation

Dust Bowl era erosion and Aeolian deposits in waterways created conditions that gave rise to hardwood trees on the BKMC NGs. Post Dust Bowl conditions have established the mixed hardwood trees and now are considered a vegetation type on the Grasslands. The mixed hardwood riparian reference condition vegetation structure on the BKMC NGs was determined from comparison of mixed hardwood riparian in other areas with similar climate, elevation, rainfall, and growing season attributes. The mixed hardwood vegetation was found to be in low departure from reference condition for vegetation structure.

Mixed hardwood riparian vegetation covers about 6 percent (1,946 acres) of the BKMC NGs. The early successional stage represents about 13 percent of this vegetation type, with pioneer tree and shrub species of cottonwoods and willows with an herbaceous understory of sedges in wet areas. In this early stage, most of the area is bare sand dominated by a young canopy of tree saplings and shrubs. Species include false indigo bush and various grasses, sedges, and rushes. The middle and late-successional stage covers the remaining 87 percent. In the mid-stage, developing stands start to mature. This community tends to be partially open with scattered cottonwoods and willows. The shrub layer is poorly developed and often consists of widely scattered patches of dogwood. The understory vegetation is highly variable with wildrye and muhly grasses. In wetter, more shaded areas, Virginia creeper, nettles, and poison ivy are present. The late seral stage is a mature, closed-canopy cottonwood flood plain forest. The canopy layer is dominated by cottonwood with box elder, hackberry, walnut, and elm occurring as well. Understory species include Virginia creeper and poison ivy, both found along the upper terrace that is protected from most flood events. Invasive eastern redcedar encroaches in the cottonwood galleries and increases fuel loads and ladder fuels.

### Shortgrass Prairie and Inclusions Vegetation

*Shortgrass prairie* on the KRB NGs is in low departure from reference condition for vegetation structure. Shortgrass prairie covers about 79 percent (181,900 acres) of the KRB NGs. The shortgrass prairie typically occurs on areas of level plains, undulating hills and draws, or on gently rolling uplands of the southern Great Plains. The variable landscape gives rise to diversity in species composition and structure in different successional stages based on multiple factors, including drought, fire, and herbivory by ungulates and rodents.

As of 2011, several KRB NGs allotments have been retired from grazing and livestock removed due to wells going dry.

Shortgrass prairie vegetation is codominated by blue grama, needle-and-thread, buffalograss, and galleta, with intermingled forbs and scattered half-shrubs. The abundance of annual forbs and grasses within the composition is dependent on the timing of precipitation events. Blue grama and buffalograss are the main grasses present in all successional stages postfire. Postfire early successional stages are dominated by resprouts and seedlings of grasses, and postfire associated forbs cover about 2 percent of this vegetation type. In addition, 1 to 4 percent of the vegetation type is an early successional stage due to current and historical BTPD activity. The mid-open stage covers about 90 percent of the shortgrass vegetation with less than 35 percent herbaceous

cover that is low to medium height. The mid-closed stage covers about 8 percent of this vegetation type with greater than 35 percent herbaceous cover. Planned fire occurs, but on a small scale and generally not within the historical fire regime of 5 to 10 years. Planned fire and managed livestock grazing/browsing are used as tools to move this vegetation type toward desired vegetation structure and species composition.

Early successional stage areal extent of shortgrass prairie on the KRB NGs is in flux. Changes are due, in part, to activities that impact BTPD colony size such as plague within BTPD colonies, recreational shooting of BTPDs, predation, and other influences. BTPD colonies on private lands within proximity or adjacent to the KRB NGs are also in flux with influences of recreational shooting of BTPDs, poisoning, and other methods of eradication used to reduce colonies and number of individuals. Conversely, there are state and Federal Government Agency programs designed to assist private landowners in BTPD colony and numbers growth.

Seventy percent of the shortgrass vegetation type is made up of shortgrass prairie species. The remaining 30 percent is made up of inclusions that have species composition and structure different from shortgrass. There are five inclusions in shortgrass prairie, as follows:

1. Mixed-grass prairie;
2. Cultivated sites plowed and reclaimed;
3. Playas;
4. Dry washes, dry swales, and seasonal depressional wetlands; and
5. Greenhorn, sandy and chalky limestone hills, knolls, gravelly balds, and mesa rims.

Mixed-grass prairie is an ecotone between shortgrass and tallgrass prairie. These sites occur on areas of sandy loam soils. Mid and tall-grass species codominate, ranging in height from 2 to 4 feet. Mid-grass prairie species such as New Mexico feathergrass, needle and thread, big bluestem, little bluestem, and hairy grama occur individually or in variable groupings with shortgrass species. Some sites support both sand sagebrush and soapweed.

*Cultivated sites* are old fields that were in cultivation prior to the 1930s Dust Bowl. They were severely eroded, with most or all of the topsoil removed through wind erosion. Where these conditions occur, species composition and site potential have been altered. This historical species change is not reversible for the foreseeable future. In some areas, vegetation is limited to sideoats grama and lovegrass that were planted during reclamation. Soil fertility in these areas is very low, and both microorganisms and organic material are present in the soil in very limited quantities.

*Playa lakes* are bowl-shaped depressions that are dependent on rainfall and surface runoff for the water they impound. They are closed basins and usually do not overflow. They are mostly intermittent, with surface evaporation occurring at about 60 inches per year. Soils are mostly stable, although some wind erosion occurs. Vegetation, when present, consists of species adapted to mesic conditions, such as various annuals, milkweeds, western wheatgrass, and inland saltgrass. Upland shortgrass species are incidental. The adjacent watershed keeps the playas functioning properly during the periodic and natural inundation of the bottoms. When playas hold water, there is an increase in the shoreline vegetative diversity and density and an increase in the extent of mudflat habitat for migratory waterfowl and shorebirds.

*Dry washes, dry swales, and seasonal depressional wetlands* include habitat associated with intermittent or ephemeral streams, draws, and swales or depressions between slopes of the gently sloping plain of Grasslands. Soils are nonhydric (not formed in the presence of water) and are dry most of the year. The soil moisture is generally higher than the surrounding uplands as a result of storage and accumulation during rainfall events. However, there is no support by the water table during the long periods between precipitation events. Consistently high soil moisture levels are not present to support obligate riparian vegetation. Vegetation in and along intermittent or ephemeral drainages or seasonal depressions may be more dense or larger than their upland counterparts. However, the species are generally upland species and are typically facultative[4] riparian or nonriparian plants, including western wheatgrass, alkali sacaton, blue grama, buffalo grass, switchgrass, inland saltgrass, and a variety of forbs. The overall condition within these communities is stable.

*Greenhorn, sandy, and chalky limestone hills and knolls*, endemic to northeastern New Mexico on the Kiowa NG, occur in shortgrass prairie in elevations ranging from 5,900 to 6,600 feet. The gravelly balds and mesa rims occur in the shortgrass steppe elevations ranging from 5,400 to 5,800 feet. The outcrops are occasionally quarried for road base materials.

#### Pinyon-Juniper and Juniper Grasslands Inclusion Vegetation

This vegetation type covers about 10 percent (21,700 acres) of the Kiowa NG. The pinyon-juniper vegetation type is determined to be in low departure from reference condition for vegetation structure.

*Pinyon-juniper* generally occurs on shallow soils types, on rocky summits of high plains, and in drainages on slopes less than 20 percent. The early successional stage occurs postfire and covers about 12 percent of the vegetation type with open areas of grasses, forbs, seedlings less than 4.5 feet in height, and saplings. The mid-late successional stage covers about 88 percent of the vegetation type and includes a mix of pinyon-juniper trees in a variety of stages with varying canopy cover as follows:

- Mid-development stages average 10 percent of the vegetation type in relative abundance and have a dense canopy cover (31 to 70 percent) of pole size trees 5 to 9 inches in diameter and very little understory.
- About 30 percent of the vegetation type has pole size trees with a mixed shrub-herbaceous understory, and canopy cover ranges from 0 to 30 percent.
- About 40 percent has late development with medium size trees 9 to 21 inches in diameter and canopy cover of 0 to 40 percent.
- About 10 percent has dense, old-growth characteristics with medium size trees and canopy cover of 41 to 70 percent.

Stands of pinyon-juniper that are overstocked or encroaching onto the shortgrass prairie are being treated with thinning and prescribed burning. Currently, the level of treatment is about 500 to 900 acres of thinning per year, followed by 1,000 to 1,800 acres of burning.

[4] Facultative riparian plants are defined as those plant species commonly found in both terrestrial upland and riparian areas.

*Juniper grassland* trees occur as individuals or in smaller groups and range from young to old with snags scattered across the landscape. The understory includes scattered shrubs, native grasses, forbs, and annuals. Smaller groups of trees are found on slopes greater than 15 percent, on rocky outcrops, and adjacent to drainages.

#### Cottonwood-Willow Riparian Vegetation (Excluding the Canadian River)

This vegetation type covers about 1 percent (1,370 acres) of the KRB NGs. It does not include the Canadian River cottonwood-willow riparian vegetation of Mills Canyon, which is addressed separately below. The cottonwood-willow riparian vegetation type is determined to be in low departure from reference condition for vegetation structure.

The cottonwood-willow riparian communities are located within stream channels and on their associated flood plains and terraces. Riparian vegetation is common with sandy alluvial soil conditions. The early successional stage is represented on about 16 percent of this vegetation type and is typically shrub-seedling dominated but grasses may codominate. The mid- and late-successional stage covers about 84 percent with a species composition of tall shrubs and small trees such as willows and cottonwoods. Late-successional stage represents the mature, large cottonwood and willow riparian woodlands. In 2011, management activities are targeting nonnative, invasive species in riparian areas, specifically saltcedar. These activities are encouraging establishment of needed mid-successional conditions.

Fremont cottonwood dominates the tree layer, with peachleaf willow present in the subcanopy. Riparian dependent species include narrowleaf cattail, common buttonbush, thinleaf or marsh alder, rocky mountain elderberry, and a variety of sedge and rush species. The primary shrub and vine species are sandbar willow, Virginia creeper, and riverbank grape. Native warm season grasses including blue grama, sideoats grama, sand dropseed, Virginia wildrye, and switchgrass are prominent in the ecosystem. Western wheatgrass is an important cool season species. Drier sites along or within ephemeral systems and upper terraces have New Mexico locust, chokecherry, hackberry, skunkbush sumac, and Apache plume.

#### Sand Sagebrush Vegetation

The sand sagebrush vegetation type covers about 8 percent (22,651 acres) of the Grasslands. This vegetation type is very underrepresented on the Southern Great Plains. Sand sagebrush typically occurs on areas of level plains, undulating hills and draws, or on gently rolling uplands of the southern Great Plains. The variable landscape gives rise to diversity in species composition and structure across the landscape. In years prior to Federal acquisition, some areas of sand sagebrush were plowed and converted to cropland. In many cases, these areas have not returned to sand sagebrush. BTPDs have colonized some of these areas on the KRB NGs.

The sand sagebrush prairie is dominated by mid-grasses and shrubs. The landscape includes a diversity of areas in different successional stages and with varying vegetative heights, as well as cool season grasses and a variety of forbs. The primary shrub species is sand sagebrush. Native, warm season perennial grasses (including big bluestem, little bluestem, sand dropseed, blue grama, and sideoats grama) are prominent in this ecosystem.

One percent is in a postfire successional stage dominated by resprouts and seedlings of grasses and forbs with low to medium height having a variable canopy cover. This stage typically occurs where fires burn relatively hot.

The mid-open successional stage represents about 65 percent and has less than 35 percent herbaceous cover, medium to tall in height.

Mid-closed stage represents about 35 percent of the area with greater than 35 percent herbaceous cover, medium to tall in height.

Planned burning is currently being used at a rate of about 500 acres every 3 to 5 years.

Sand sagebrush vegetation type has areas that were historically heavily plowed with species structure and composition altered to low vegetation. The BTPD colonizes areas with low, early successional stage vegetation. Some of the plowed areas have potential for BTPD colonization, and one area is currently occupied. Areal extent of early successional stage sand sagebrush on the KRB NGs is in flux. Changes due to BTPD activity, plague within BTPD colonies, recreational shooting of BTPDs, and predation influence this vegetation.

#### Vegetation in Canyon Lowlands and the Canadian River Cottonwood-Willow Riparian

This area is defined geographically by the Canadian River canyon gorge on the Mills Canyon MA of the Kiowa NG, with elevations around 6,100 feet at the river.

*Canyon lowlands* of the Canadian River valley include the gently sloping lowlands found between the riparian area of the Canadian River and side drainages coming off of the nearly vertical slopes forming the walls of the river canyon. This small, localized vegetation type has not been rated for departure from reference condition for vegetation structure. These lowlands are characterized by sloping terraces of less than 15 percent. In the active flood plain, flooding frequency determines vegetation composition and successional patterns. The lower area of 2- to 5-year flooding is where the vegetation is comprised mostly of annuals and other riparian disturbance-dependent species.

The upper area of less frequent flooding (flood return intervals of 100 to 500 years) is where the woodland community advances onto the secondary flood plain exhibited by oneseed juniper, pinyon pine, wavy leaf oak, cholla, and sumac with an understory of herbaceous silver bluestem, sand dropseed, vine mesquite, and blue grama.

*Cottonwood-Willow Riparian Canadian River* follows the river as it meanders about 19 miles through the semiarid landscape in the Canadian River gorge, locally known as Mills Canyon. Snowmelt and seasonal rains are the major flow sources; snowmelt is often diverted for irrigation and other uses before the waters reach the Mills Canyon area. Depending on the location of seasonal rain events, that water may or may not meet the same fate.

Along the canyon bottom, within the river flood plain, vegetation is dominated by riparian species, including willow and cottonwood. The cottonwood-willow riparian communities are located within and adjacent to stream channels and include the associated flood plains and lower terraces. Riparian vegetation is common with sandy alluvial soil conditions. This localized vegetation type along the Canadian River is in low departure from the cottonwood-willow

reference condition for vegetation structure. The early successional stage is represented on about 16 percent of this vegetation type and is typically shrub-seedling dominated, but grasses may codominate. The mid- and late-successional stage covers about 84 percent of species composition that includes tall shrubs and small trees such as willows and cottonwoods. The late successional stage represents the mature, large cottonwood and willow riparian woodlands. Much of the native riparian vegetation has been replaced by saltcedar. In 2009 and 2010, about 500 acres of saltcedar in Mills Canyon were chemically treated.

In the Mills Canyon area of the Canadian River, upstream diversions and invasion of saltcedar have altered hydrological processes and geomorphology, thereby reducing water availability for adjacent cottonwood-willow riparian vegetation. The Grasslands have no control over streamflows reaching the northern boundary of the Mills Canyon area.

## Environmental Consequences

*Common to All Alternatives.* The mixed-grass prairie, shinnery oak, shortgrass prairie, and sand sagebrush vegetation types would use managed livestock grazing and planned fire to provide disturbance to vegetation that evolved under disturbance regimes, benefiting all vegetation structure and composition makeup, and controlling some invasive and undesirable species.

*Alternatives B and C for All Vegetation Types.* Effects of climate change could include drought events or long-term increases in precipitation, and higher annual average temperatures that would alter vegetation structure and composition. Vegetation types would move toward desired vegetation structure and species composition and would be resilient to the stressors of climate change through increased awareness of potential effects of climate change and strategies for adaptive responses. (See the “Kiowa, Rita Blanca, Black Kettle, McClellan Creek Land and Resource Management Plan, Appendix B: Southwestern Region Climate Change Trends and Potential Climate Change Strategies for Southwestern Region National Forests.”)

### Mixed-grass Prairie Vegetation Consequences

*Alternative A.* Mixed-grass prairie would remain in its current state of departure from reference condition for vegetation structure, or more likely, become moderately to highly departed from reference condition because of continued encroachment of undesirable native invasive trees such as eastern redcedar and black locust. This alternative would protect and maintain shelterbelts that occur in this vegetation type, which could be contrary to desired vegetation structure and species composition.

*Alternatives B and C.* Implementation would achieve desired vegetation structure and species composition of the mixed-grass prairie across the landscape by reducing the presence of undesirable native invasive trees such as eastern redcedar and black locust.

### Shinnery Oak Vegetation Consequences

*Alternative A.* The specific direction to control shinnery oak by chemical or mechanical means would result in about 12 percent reduction of areal coverage of this vegetation type, which is already a very underrepresented vegetation type on the Southern Great Plains. Control of undesirable native invasive trees would not be prioritized under this alternative, and management could result in a slow drift away from desired vegetation structure and species composition.

*Alternatives B and C.* Implementation would maintain or slowly increase acreage of this vegetation type on the BK NG. This alternative would result in removal of undesirable native invasive trees (e.g., black locust and eastern redcedar) within shinnery oak. Implementation would result in shinnery oak on the BK NG moving toward the treeless desired condition for this vegetation type, and application of managed grazing, planned fire, or mechanical or chemical tools would result in achievement of desired vegetation structure and species composition.

#### Mixed Hardwood Riparian Vegetation Consequences

*Alternative A.* Implementation would allow higher fuel loads from encroachment by eastern redcedar in the understory, increasing mortality of deciduous trees.

*Alternatives B and C.* Implementation would result in reducing encroachment of eastern redcedar in the understory, thereby lowering fuel loads. This vegetation type would move toward desired vegetation structure and species composition, as targets for species composition and structure are clearly defined.

#### Shortgrass Prairie and Inclusions Vegetation Consequences

*Alternative A.* Implementation would allow managed grazing and planned fire, but since there is no direction defining structure and composition, outcomes would be uncertain.

*Alternatives B and C.* Implementation would move this vegetation type toward desired vegetation structure and species composition, as targets for species composition and structure are clearly defined.

#### Pinyon-Juniper and Juniper Grasslands Inclusion Vegetation Consequences

*Alternative A.* Implementation would allow silvicultural management, managed grazing, and planned fire to achieve management objectives but would provide an unpredictable state of species composition and structure since there are no defined targets. Implementation would not result in a diversity of structural stages in pinyon-juniper habitat, thus limiting early and mid-seral stage.

*Alternatives B and C.* Implementation would result in moving toward desired vegetation structure and species composition through defined targets for structure and composition outcomes, with additional focus on early seral stage habitat.

#### Cottonwood-Willow Riparian (excluding the Canadian River) Vegetation Consequences

*Common to All Alternatives.* Managed livestock use, planned fire, and invasive species control would have some beneficial consequences to vegetation conditions.

*Alternative A.* Implementation may result in this vegetation drifting away from reference condition for vegetation structure, as there are no defined targets for long-term maintenance of species composition or structure.

*Alternatives B and C.* Implementation would move this vegetation type toward defined desired vegetation structure and species composition through the utilization of invasive species controls, restoration plantings, and managed livestock use.

#### Sand Sagebrush Vegetation Consequences

*Alternative A.* Sand sagebrush would be maintained in its current state or possibly move away from reference condition for vegetation structure as this alternative has no defined targets for long-term maintenance of this vegetation type.

*Alternatives B and C.* Management direction would move toward desired vegetation structure and species composition, accomplished through well-defined targets for this vegetation type.

#### Canyon Lowlands, Cottonwood-Willow Riparian and Canadian River Vegetation Consequences

*Common to All Alternatives.* There would be reduced water availability for adjacent cottonwood-willow riparian vegetation in the Mills Canyon area due to off Grasslands circumstances. Reduced water in this reach of the Canadian River would likely result in saltcedar constantly encroaching into the cottonwood-willow vegetation in this area to the exclusion of native trees, shrubs, grasses, and forbs unless control intervention is pursued.

*Alternative A.* There is no direction defining structure and composition. Outcomes would be uncertain.

*Alternative B.* Implementation would move toward a defined structure and composition outcome for the Canadian River cottonwood-willow riparian vegetation with focus on early seral stage development.

*Alternative C.* Same as alternative B except wilderness designation would delay achievement of desired vegetation structure and species composition outcomes because of limitations on use of motorized management tools.

### Cumulative Consequences

#### Vegetation Cottonwood-Willow on the Canadian River

*Common to All Alternatives.* Consequences to vegetation and wildlife on the Mills Canyon reach of the Canadian River cottonwood-willow vegetation type would likely be as follows: continued upstream water diversion from the Canadian River would reduce water availability for adjacent cottonwood-willow riparian vegetation in Mills Canyon. This would likely result in saltcedar dominating the cottonwood-willow vegetation in this area to the exclusion of native trees, shrubs, grasses, and forbs, and to the detriment of native wildlife dependent upon the cottonwood-willow vegetation type.

## Wildlife and Habitat

### Introduction

This section is organized to address affected environment and environmental consequences to the federally listed and proposed species and critical habitat, Grasslands sensitive species, viability high at-risk species, migratory birds and National Birds of Conservation Concern, eagles, and

management indicator species within the planning area. Species are listed for each category with occurrence and summary information provided as they pertain to plan components. The affected environment related to the environmental consequences are described and followed by the consequences analysis.

Documentation of the complete viability analysis process, prepared according to Forest Service policy (FSM 2670) is located in "Appendix F. Coarse Filter/Fine Filter and Viability Evaluations," and the "Grasslands Ecological Sustainability Report" (see the Web address provided in appendix B of this document).

As a starting point, a comprehensive list of species (including plant, macro-lichen, bird, insect, and animal species) that have population or habitat concerns and that are found in Texas, New Mexico, and Oklahoma was developed from multiple sources, resulting in over 1,600 species. Then, each species' life history, habitat associations, and population information were examined using scientific literature, Texas, Oklahoma, and New Mexico Comprehensive Wildlife Conservation Strategies (CWCS), the Biota Information System of New Mexico (BISON-M) database, and personal communications with Oklahoma, Texas, and New Mexico wildlife agency biologists, USFWS biologists, and Grasslands' biologists. Other important sources considered in a species' viability determination were the USFWS National Birds of Conservation Concern (NBCC) list, and state threatened and endangered species lists. After considering the above and integrating with information on the existing condition of the vegetation types as described below, a determination was made that 5 species out of the 1,600 may have high at-risk viability concerns on the Grasslands.

The historical reference condition of a vegetation type found on the Grasslands is based upon best available science and includes an approximation of the structure of the vegetation type when all historical ecological functions and processes were in place. The condition of the structure of a vegetation type was a primary factor used to determine a wildlife species' viability on the Grasslands. Other ecosystem attributes (including soil type and water availability) were also assessed as to how they affect the habitat of a species. Viability risks to a species were determined from availability and structural condition of the vegetation type the species typically occupies, population evaluation, and effects from Forest Service management actions.[5] The results of this process provided a high, medium, or low risk assessment of the viability of a species. Again, five species were assessed as high. See the Web address provided in appendix B for the "Grasslands Ecological Sustainability Report" and "Appendix E. Status of Species," which allows for review of the full analyses for each species in its respective habitat.

In the plan revision process for alternatives B and C, coarse-filter plan components (i.e., desired conditions) were developed that would move the Grassland's vegetation types toward reference condition for structure and composition. These coarse-filter plan components would provide for viability of those species at low or medium risk. For those species determined to be high at-risk, additional fine-filter plan components (i.e., objectives, guidelines, and standards) were developed to provide for their viability. Table 8 identifies the high at-risk species.

[5] "Fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired nonnative vertebrate species in the planning area. For planning purposes, a viable population shall be regarded as one which has the estimated numbers and distribution of reproductive individuals to insure its continued existence is well distributed in the planning area..." (1982 Rule Provisions Section 219.19).

As part of the environmental analysis, suitable habitat acreage was estimated for threatened and endangered species, species high at-risk for viability, and MIS, as shown in table 8, and Grasslands sensitive species suitable acreage is shown in table 7. Additionally, anticipated suitable habitat acreage by alternative is provided in tables 10−14 and 19−21 for each species. As an example, Lesser Prairie-chicken (LPC) selects certain vegetative structures and avoids areas with trees and other tall features. Mixed-grass prairie and shinnery oak have invasive trees present that degrade LPC habitat that creates avoidance areas, thus reducing the amount of suitable LPC habitat. Other species, such as hawks, are opportunistic to all stages of the vegetation and utilize the entire area.

### Threatened, Endangered, and Proposed Species

Federally listed threatened and endangered species are those plant and animal species formally listed by the U.S. Fish and Wildlife Service (USFWS) under authority of the Endangered Species Act (ESA) of 1973, as amended. Pursuant to Section 7(2)(a) of the ESA, a biological assessment will be prepared to assess the effects of implementing the Grasslands plan selected alternative on endangered or threatened species and ensure that proposed actions in the selected alternative would not jeopardize the continued existence of listed species. All federally listed, proposed, and candidate species and designated and proposed critical habitats that the USFWS has identified in its Southwest Region Threatened/Endangered Species List (http://www.fws.gov/southwest/es/EndangeredSpecies/lists/) were considered in this analysis.

There is no designated critical habitat (CH) for listed species in the action area. Although the Mountain Plover was proposed for listing under the ESA when the plan was being developed, it was withdrawn from listing in May 2011. It will be considered as a Grasslands sensitive species in this analysis. The federally listed wildlife species which may occur within the same counties as the Grasslands and considered in this analysis are listed in table 6.

**Table 6. Federally listed threatened, endangered, and candidate species considered in the analysis area**

| Common Name | Scientific Name | Federal Status | Critical Habitat |
|---|---|---|---|
| Southwestern Willow Fycatcher (SWF) | *Empidonax traillii extimus* | Endangered<br>New Mexico: Colfax and Mora Counties. | Outside distinct population segment (DPS) boundary. No CH in analysis area. |
| Black-footed ferret (BFF) | *Mustela nigripes* | Endangered<br>New Mexico: Colfax, Mora, Union, and Harding Counties | None designated |
| Mexican Spotted Owl (MSO) | *Strix occidentalis lucida* | Threatened<br>New Mexico: Colfax and Mora Counties | No CH in analysis area |
| Piping Plover | *Charadrius melodus* | Threatened<br>New Mexico: Colfax County | No CH in analysis area |

| Common Name | Scientific Name | Federal Status | Critical Habitat |
|---|---|---|---|
| Arkansas River shiner | *Notropis girardi* | Threatened<br>New Mexico: Colfax, Mora, Union, and Harding Counties<br>Oklahoma: Roger Mills County<br>Texas: Hemphill County | No CH in analysis area |
| Interior Least Tern | *Sterna antillarum* | Endangered<br>Texas: Gray and Hemphill Counties<br>Oklahoma: Cimarron and Roger Mills Counties | None designated |
| Whooping Crane | *Grus americana* | Endangered EXPN<br>Texas: Gray and Hemphill Counties<br>Oklahoma: Roger Mills County | No CH in analysis area |

*Southwestern Willow Flycatcher*. The SWF breeds in dense riparian habitats in southwestern North America, and winters in southern Mexico, Central America, and northern South America. Species occurrence in Colfax and Mora Counties is part of the Upper Rio Grande Management Unit. The Grasslands are outside the DPS for this species. There is no SWF habitat on the Kiowa NG in Colfax and Mora Counties, therefore, this species will not be considered further in this analysis.

*Black-footed Ferret*s. This species depends almost exclusively on BTPD colonies for food, shelter, and denning. The range of the ferret coincides with that of BTPDs and ferrets with young have been documented only in the vicinity of active BTPD colonies. The KRB NGs is currently managing BTPDs to provide improved health of colonies in a potential reintroduction area by dusting prairie dog burrows with insecticide for controlling sylvatic plague carrying fleas, but existing colonies are not currently large enough to support a reintroduction. If black-footed ferret reintroduction is deemed appropriate for the KBR NG, a separate NEPA document will be prepared for the reintroduction. Since the ferret is extirpated from New Mexico (except for an experimental nonessential population), it will not be considered further in this analysis.

*Mexican Spotted Owl.* In general Mexican Spotted Owl habitat consists of dense multistory stands of mixed conifer with a component of large trees, often old remnants in younger stands or mature or over mature stands. Spotted owls also prefer shaded, cool, moist canyon sites and mountain slopes with rock outcrops, cliffs, talus, and standing dead and down woody material. There is no habitat available for the Mexican Spotted Owl within the analysis area, so this species will not be considered further in this analysis.

*Piping Plover.* The Piping Plover migrates mainly through the Mississippi Valley and along the Atlantic coast, and it winters primarily along the Atlantic and Gulf coasts from South Carolina to Texas. In New Mexico this plover is known only as a rare spring (April) migrant, having been verified at Springer Lake (Colfax Co.) and reliably reported at Bosque del Apache National

Wildlife Refuge (Socorro Co.); there is also an unsubstantiated report from Lake Avalon (Eddy Co.). This species does not occur in the analysis area and will not be considered further.

*Whooping Crane* passes through the eastern panhandle of Texas each spring and fall during migration where they are sometimes sighted at stopover points along rivers, in grain fields, or in shallow wetlands. This species has never been observed on the MC NG in Gray County, Texas, and there are no suitable stopover habitats on the national grasslands. This species has never been observed at the Lake Marvin Unit in Hemphill County, Texas. The Whooping Crane passes through western Oklahoma each spring and fall during migration. They are sometimes sighted at stopover points along rivers, in grain fields, or in shallow wetlands. This species has never been observed on the BK NG in Roger Mills County, Oklahoma. This species will not be considered further in this analysis.

From the species listed in table 6 and the above narrative, only the Interior Least Tern and the Arkansas River shiner will be analyzed, because the other species either do not occur in the habitat types found on the Grassland or they are rare migrants which would be unaffected by proposed activities.

## Affected Environment

### Interior Least Tern and Arkansas River Shiner Aquatic Lakes Habitat

The Grasslands provide habitat for some species that are not directly related to a vegetation type. At full pool levels, there can be about 5,000 acres of aquatic lake habitat available for the Interior Least Tern, a species known to forage the waters of Lake McClellan and Lake Marvin in Texas.

### Arkansas River Shiner Critical Habitat

The NGs have streams that have not been historically occupied nor have they been considered as critical habitat (CH). BK NG borders and drains directly into previously designated CH on the Canadian River.

The BKMC NGs have no occupied or suitable habitat for the Arkansas River shiner, a Federal threatened species; however, the Texas portion of the BK NG includes 540 acres of the Boggy Creek Watershed (Lake Marvin), which drains into occupied habitat on the Canadian River, which is only ½ mile downstream from the BK NG boundary.

Critical habitat was first designated for the Arkansas River shiner in 2001, but none of the river segments designated as critical habitat are located on USFS managed lands in the planning area. In 2005, CH was excluded in Units 1a and 1b due to many factors. Critical habitat was excluded in Unit 1a because there are occasional periods of no flow, large areas are under private ownership, and many areas lack features essential to the conservation of the species. In New Mexico, the Canadian River rarely contains suitable habitat due to the influence of the Ute Reservoir. Unit 1a is located 79.6 miles downstream from the Kiowa NG. The Canadian River flows through the Kiowa NG in Mills Canyon, but Unit 1a is downstream from Ute Dam so there is no direct or indirect connection between the CH and Kiowa NG. The RB NG is located 82.2 miles upstream from the uppermost previous CH in the Beaver River, which is downstream from Optima Dam. There is no direct or indirect connection between the previous CH in the Beaver River and RB NG.

Critical habitat has been excluded in Unit 1b because it is predominantly in private ownership with limited areas of state and tribal ownership and areas in Unit1b that have been excluded from CH designation do not meet the definition of CH. The BK NG manages units in Texas and Oklahoma that drain into previously designated CH (Unit 1b) in the Canadian River. The Texas portion of the Grassland manages 540 acres of the Boggy Creek Watershed near Lake Marvin in Hemphill County, which drains into previously designated CH on the Canadian River about ½ mile downstream from the NG boundary. The Oklahoma portion manages about 640 acres of watersheds that drain into previously designated CH in the Canadian River as close as 2 miles downstream from the Grassland boundary in Roger Mills County. Arkansas River shiner CH was previously designated in 1,148 miles in five river systems, of which 4 percent of that drained into CH from the BK NG (24.5 miles, Lake Marvin; 22.9 miles, Black Kettle, OK). Black Kettle NG manages 1,180 acres that drain into CH.

## Environmental Consequences

### Interior Least Tern and Arkansas River Shiner

*Common to All Alternatives.* Implementation of any alternative would not produce any differences in consequences to aquatic lakes or the species associated, due to the limited influence from Grasslands management. There would be no difference in suitable acres of habitat for either Interior Least Tern or Arkansas River shiner by alternative.

### Interior Least Tern *(Sterna antillarum athalassos)*

**Determination of Effect for Interior Least Tern**

The primary threat to the Interior Least Tern is habitat loss, specifically the construction of reservoirs and pools along rivers. Under all alternatives, there is no plan direction to construct reservoirs or ponds on the Canadian River in Texas, Oklahoma, or its tributaries, although there are existing reservoirs that will be maintained.

*Common to All Alternatives.* Threats to the Interior Least Tern were reviewed to determine potential links to resource programs and plan components. There are no plan components that were developed specifically for the Interior Least Tern, as there is no breeding habitat on the NGs, and the species is only seen foraging on the lakes within the BKMC NGs. In general, implementation of plan components related to the improvement of watershed conditions, minerals/energy development, recreation, and grazing management should result in positive effects to the Interior Least Tern by indirectly protecting foraging habitat occasionally used by the Interior Least Tern. Implementation would result in a “May Affect, Not likely to Adversely Affect” determination for the Interior Least Tern. Informal consultation with the USFWS would occur to seek concurrence on the determination.

*Alternatives B and C.* There are course filter plan components developed that would indirectly benefit the Interior Least Tern through desired conditions designed to improve watershed conditions over time. Recommendation of the Canadian River Potential Wilderness on the Kiowa NG would not affect the Interior Least Tern since it does not occur there.

### Arkansas River Shiner *(Notropis girardi)* Including Designated Critical Habitat

#### Determination of Effect for Arkansas River Shiner

Primary threats to the Arkansas River shiner include groundwater pumping, diversion of surface water, and impoundments, all which affect surface waterflows and water quality. Waters occupied by the Arkansas River shiner do not occur within the BK NG, yet the BK NG manages 1,180 acres that drain into occupied habitat, which is an insignificant amount of habitat compared to the entire occupied habitat of the shiner.

*Common to All Alternatives.* Primary threats to the Arkansas River shiner were reviewed to determine potential links to Grasslands resource programs and plan components. There are no plan components that were developed specifically for the Arkansas River shiner, as there is no occupied habitat on the national grasslands. In general, implementation of plan components related to the improvement of watershed conditions, minerals and energy development, recreation and grazing management should result in positive effects to the Arkansas River shiner by indirectly protecting watersheds that drain into occupied habitat in the Canadian River in Texas and Oklahoma. Implementation of any alternative may render a "May Affect but is Not Likely to Adversely Affect" determination for the Arkansas River shiner.

#### Critical Habitat Determination of Effects for Arkansas River Shiner

Designation for CH has been removed for areas that would have had indirect affects to the Arkansas River shiner. Even though critical habitat has been removed, riparian, wetland, wildlife, and threatened and endangered species values and habitats are protected by desired condition in alternatives B and C.

#### Critical Habitat Effects Analysis

*Common to All Alternatives.* Plan components have discountable indirect effects to critical habitat, because:

- Critical habitat has been removed from areas in Unit 1a and 1b that occurred adjacent to or drained into previously designated critical habitat;
- Grasslands have limited ownership; and
- Plan components promote protection and recovery of listed species as well as riparian, wetland, and wildlife habitat.

Therefore, the continued implementation of any alternative may render a "May Affect, but is Not Likely to Adversely Affect, Critical Habitat" determination for the Arkansas River shiner.

## Regional Forester's Grasslands Sensitive Species List

The Regional Forester's sensitive species program is the Forest Service's dedicated initiative to conserve and recover plant and animal species according to Forest Service policy (FSM 2670). The NGs improve habitat and restore ecosystems for sensitive species through vegetation treatments and management practices. Grasslands sensitive species are those plant and animal species identified by a regional forester for which population viability is a concern, as evidenced by the following:

- Significant current or predicted downward trends in population numbers or density
- Significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution.

The suitable acreage or river miles estimates reported in table 7 are based upon the vegetation types, inclusions, or riverine habitat that meet the life history requirements of the species.

**Table 7. Regional Forester's Grasslands Sensitive Species List**

| Regional Forester's Grasslands Sensitive Species List for Kiowa, Rita Blanca, Black Kettle, and McClellan Creek National Grasslands | | | |
|---|---|---|---|
| **Common Name** | **Scientific Name** | **Suitable Habitat Acres or River Miles** | |
| | | **BKMC NGs** | **KRB NGs** |
| **Amphibians** | | | |
| Plains leopard frog | *Rana blairi* | about 2,000 acres | 4,700 to 8,300 acres |
| Great Plains narrow-mouthed toad | *Gastrophryne olivacea* | about 2,000 acres | about 3,000 acres |
| **Fish** | | | |
| Rio Grande chub | *Gila pandora* | about 12 miles | about 17 miles Canadian River |
| Suckermouth minnow | *Phenacobius mirabilis* | | |
| **Birds** | | | |
| Bald Eagle | *Haliaetus leucocephalus* | about 2,000 acres | about 3,000 acres |
| White-faced Ibis | *Plegadis chihi* | 0 | 1,820 to 5,460 acres |
| Zone-tailed Hawk | *Buteo albonotatus* | 0 | about 6,000 acres |
| Swainson's Hawk | *Buteo swainsoni* | about 32,000 acres | about 10,000 acres |
| Ferruginous Hawk | *Buteo regalis* | 0 | about 200,000 acres |
| American Peregrine Falcon | *Falco peregrinus (anatum)* | 0 | about 6,000 acres |
| Lesser Prairie-chicken | *Tympanuchus pallidicinctus* | about 28,000 acres | about 22,650 acres |
| Mountain Plover | *Charadrius montanus* | 0 | about 51,000 acres |
| Burrowing Owl | *Athene curnicularia (hypugaea)* | about 6,000 acres | about 51,000 acres |
| Loggerhead Shrike | *Lanius ludovicianus* | about 32,000 acres | about 204,000 acres |
| Yellow-billed Cuckoo | *Coccyzus americanus occidentalis* | Outside distinct population segment boundary | |
| **Mammals** | | | |
| Pale Townsend's big-eared bat | *Corynorhinus townsendii (pallescens)* | 0 | about 3,000 acres |
| Black-tailed prairie dog | *Cynomys ludovicianus* | 0 | about 51,000 acres |

| Regional Forester's Grasslands Sensitive Species List for Kiowa, Rita Blanca, Black Kettle, and McClellan Creek National Grasslands | | | |
|---|---|---|---|
| Common Name | Scientific Name | Suitable Habitat Acres or River Miles | |
| | | BKMC NGs | KRB NGs |
| Sandhills white-tailed deer | Odocoileus virginianus texana | 0 | About 5,000 acres |
| **Reptiles** | | | |
| Arid land ribbon snake | *Thamnophis proximus diabolicus* | 0 | about 3,000 acres |
| **Plants** | | | |
| Greene milkweed | *Asclepias uncialis ssp. uncialis* | 0 | about 3,000 acres |
| One-flowered milkvetch | *Astragalus wittmannii* | 0 | about 3,000 acres |
| Spellingberg's groundsel | *Packera spellenbergii (=Senecio s.)* | 0 | about 3,000 acres |

Acreage is given for all Grasslands sensitive species. The viability assessment, described below and in the "Wildlife" section "Introduction" determined that some Grasslands sensitive species are not at-risk, thus there are no differences in consequences among alternatives and analysis was stopped for those species.

All Grassland sensitive species were included in the species viability assessment. The viability determination process is described in the "Species Viability" section. Those species that were determined to have habitat or population viability issues that Grasslands management could affect are considered to be high at-risk and are discussed in that section. The Grasslands sensitive species deemed to be high at-risk and carried forward for further analysis are the plains leopard frog on KRB NGs and the Lesser Prairie-chicken, black-tailed prairie dog, and Mountain Plover. Affected environment and environmental consequences for these species follow in the "Species Viability" section as well.

All other sensitive species are considered to be secure with regard to habitat and population viability and conserved by coarse filter plan components (i.e., desired conditions).

### Species Viability

The viability of all species analyzed was provided by coarse-filter ecosystem components except for the species listed in table 8. Based on the viability assessment process described in the introduction to the "Wildlife and Habitat" section in this chapter, the wildlife and fish species discussed hereafter are species requiring additional plan protections to ensure viability.

Table 8 is a summary of the vegetation/habitat types and suitable habitat acreage for these species.

**Table 8. Grasslands habitat/species associations, viability risk, reasons for consideration, and suitable acres of habitat**

| Common Name | Ranger District | Viability Overall Risk | Reason for Consideration* | | | 2008 Total or Range of Suitable Habitat Acreage and Percent of Area |
|---|---|---|---|---|---|---|
| | | | Viability Listing Source | Forest Sensitive List | MIS or At-Risk Species | |
| **Mixed-grass Prairie — Total Acres 11,300** | | | | | | |
| Lesser Prairie-chicken | BKMC | High | B, C, J, O | K | N | 9,940 to 10,620<br>88 to 94% |
| **Shinnery Oak — Total Acres 18,900** | | | | | | |
| Lesser Prairie-chicken | BKMC | High | B, C, J, O | K | N | 16,630 to 17,770<br>88 to 94% |
| **Shortgrass Prairie — Total Acres 181,900** | | | | | | |
| Black-tailed prairie dog | KRB | High | C, I | K | N | 50,930<br>About 28% |
| Mountain Plover | KRB | High | A, B, C, O | K | N | 50,930<br>About 28% |
| Swift fox | KRB | High | G | | N | 181,900<br>100% |
| **Playa Inclusion — Total Acres 1,820−5,460** | | | | | | |
| Plains leopard frog | KRB | High | B | K | N | 1,820 to 5,460<br>100% |
| **Cottonwood-Willow Riparian — Total Acres 1,370** | | | | | | |
| Plains leopard frog | KRB | High | B | K | N | 1,370<br>100% |
| **Sand Sagebrush — Total Acres 22,650** | | | | | | |
| Lesser Prairie-chicken | KRB | High | B, J, O | K | N | 22,650<br>100% |
| Black-tailed prairie dog | KRB | High | I | K | N | 230 to 2,300<br>1 to 10% |
| **Canyon Lowlands and Canadian River Cottonwood-Willow Riparian — Total Acres 1,500** | | | | | | |
| Plains leopard frog | KRB | High | B | K | N | 1,500<br>100% |

*A = NM CWCS, B = TX CWCS, C = OK CWCS, G = Nature Serve N, I = Nature Serve State (NM), J = USFWS Candidate, K = Regional Forester's Grasslands Sensitive Species List, N = Viability High At-risk Species, O = National Bird of Conservation Concern.

## Affected Environment

The current condition of vegetation on the Grasslands has been determined to be within low departure from reference condition for vegetation structure, and this state generally provides

secure requisite habitat conditions for associated species. Based on this premise, "coarse filter" plan components in alternatives B and C are anticipated to conserve wildlife, fish, and plant species with stable populations on the Grasslands. All of these species are considered viable, and there would be no trend toward future listing under any of the action alternatives. The species for which additional plan components were required to assure viability are discussed below.

#### Lesser Prairie-chicken General Habitat

The Crucial Habitat Assessment Tool (CHAT)[6] categorizes LPC habitat on the BKMC NGs as: Irreplaceable–378 acres (1 percent); Limiting–17,937 acres (55 percent); Significant–11,371 acres (35 percent); and Unknown–3,064 acres (9 percent).

#### Lesser Prairie-chicken on Mixed-grass Prairie

The Lesser Prairie-chicken, a Federal candidate, a viability high at-risk species, a Grasslands sensitive species, and a National Bird of Conservation Concern is a species associated with mixed-grass prairie. For a more complete description of the mixed-grass prairie vegetation type, see the "Vegetation" section of this chapter. In 2011, no breeding populations of LPC occurred in the mixed-grass prairie on the BKMC NGs, but they are known to occur nearby on private land. Habitat for the LPC is provided by the diverse structure and composition features of mixed-grass prairie. Tree encroachment on mixed-grass prairie has degraded the habitat for LPC by providing perches for predators such as hawks that prey on LPCs. In addition, utility transmission poles provide predator perches as well. Total acreage of suitable habitat for LPC is not the total area of mixed-grass prairie due to avoidance behavior of the birds from trees and other tall structures. About 88 to 94 percent (9,940 to 10,620 acres) of the mixed-grass prairie is suitable habitat for the LPC.

#### Lesser Prairie-chicken on Shinnery Oak

In 2011, no LPC breeding populations occurred in shinnery oak habitat on the BKMC NGs but they are known to occur nearby on private land. For a more complete description of the shinnery oak vegetation type, see the "Vegetation" section of this chapter. LPC habitat is provided by the diverse structure and composition features of shinnery oak shrubland. Tree encroachment on shinnery oak vegetation has degraded LPC habitat by providing perches for predators such as hawks that prey on LPCs. In addition, utility transmission poles provide predator perches as well. Total acres of suitable LPC habitat is not the total area of shinnery oak due to avoidance behavior of the birds from trees and other tall structures. About 88 to 94 percent (16,630 to 17,770 acres) of the shinnery oak is suitable habitat.

#### Lesser Prairie-chicken and Black-tailed Prairie Dog on Sand Sagebrush

The Lesser Prairie-chicken is often found in habitat with the diverse structure and composition features of sand sagebrush. For a more complete description of the sand sagebrush vegetation type, see the "Vegetation" section of this chapter. Currently, no LPC breeding population occurs in sand sagebrush on the KRB NGs, but the bird is believed to once have occurred in this habitat on the KRB NGs. Tall structures such as utility transmission poles degrade LPC habitat by

[6] Southern Great Plains Crucial Habitat Assessment Tool. September, 2011. http://kars.ku.edu/maps/sgpchat/

providing perches for predators such as hawks that prey on LPCs. Sand sagebrush vegetation type has areas that were historically heavily plowed with species structure and composition altered to low vegetation. The BTPD colonizes areas with low, early successional stage vegetation. Some of the plowed areas have potential for BTPD colonization, and one area is currently occupied. Areal extent of early successional stage sand sagebrush on the KRB is in flux. Changes due to BTPD activity, plague within BTPD colonies, recreational shooting of BTPDs, and predation influence this vegetation. Currently there is no ongoing program of poisoning BTPDs on the Grasslands.

As of 2008 there was about 22,650 acres of suitable habitat for LPC in sand sagebrush on the KRB, and about 1 to 10 percent (230 to 2,300) is suitable for BTPD.

#### Black-tailed Prairie Dog on Shortgrass Prairie

The BTPD is a viability high at-risk species on the shortgrass prairie, where it maintains or utilizes early successional, low structure vegetation features. Historically, BTPD colonies occupied about 20 percent of the Great Plains prairie. BTPD habitat exists on the KRB NGs in the form of suitable habitat (colonized or highly likely to support BTPD colonies) or potential habitat that could support BTPD colonies. Early successional stage, low structure vegetation features of shortgrass prairie are endemic to BTPD colonies. These colonies provide complementary habitat for Mountain Plover, and swift fox, species with viability high at-risk concerns. In 2011, there were about 3,800 acres of occupied BTPD colonies on the KRB NGs. Over the last 12 years, occupied area has ranged from a low of about 1,660 acres in 2006 to around 7,100 acres in 2003. Of the 181,900 acres of shortgrass prairie, roughly 28 percent (50,930 acres) is suitable habitat for BTPD (see appendix A in USFS Cibola National Forest 2011d).

#### Mountain Plover on Shortgrass Prairie

Mountain Plover is a viability high at-risk species on shortgrass prairie, where it occupies and uses early successional, low structure vegetation features often associated with BTPD colonies, disturbed areas around windmills and water tanks, and barren playas. There is a strong association with BTPDs and other burrowing mammals throughout its range which creates and maintains a mosaic of vegetation and bare ground to which Mountain Plovers have adapted. The suitable habitat for Mountain Plover is the same as that for the BTPD.

#### Swift Fox on Shortgrass Prairie

Swift fox is a viability high at-risk species on shortgrass prairie, where they occupy early successional, low structure vegetation features, endemic to BTPD colonies. The suitable habitat for swift fox is basically all 181,900 acres of the shortgrass prairie and inclusions due to the fox being a predator that uses the entire landscape.

#### Plains Leopard Frog on Playa Lakes

Plains leopard frog is a species assessed to have high viability risks, occurs in playa lakes, seasonal depressional wetlands, streams, ponds, irrigation ditches, pools in rocky canyons, and rivers on the KRB NGs. Total acres of suitable habitat for plains leopard frog is within a range of 1,820−5,460 acres due to the ephemeral nature of seasonal wetlands.

## Environmental Consequences

Section 1502.2(b) of the National Environmental Policy Act requires for discussion of impacts in proportion to their significance. The environmental consequences in this section focus on the components of vegetation types and the five wildlife species determined to be high at-risk in the plan area. This discussion of environmental consequences is intended to be useful to the decision maker and the public. Additional information is in the "Vegetation and Wildlife Specialist Report" (USDA Forest Service 2011d).

The species assessed to have viability high at-risk concerns in the coarse- and fine-filter analysis were further analyzed for threats, and plan components were developed in alternatives B and C to provide for species viability. The plan components relevant for each high at-risk species are presented and precede the environmental consequences.

### Lesser Prairie-chicken on Mixed-grass Prairie, Shinnery Oak, and Sand Sagebrush Plan Components

Threats are:

- habitat degradation and fragmentation
- predation
- invasive species

**Table 9. Alternatives B and C plan components that address the threats to the Lesser Prairie-chicken**

| LPC | Desired Condition | Objectives | Guidelines |
|---|---|---|---|
| Mixed-grass prairie | The mixed-grass prairie species composition provides vegetation structure and height relationships necessary for ground nesting bird cover and brood rearing habitat. Small areas of short structured herbaceous vegetation or patches of bare ground are available for LPC leks and courtship areas. Small areas or patches of bare ground are present that provide wildlife travel corridors, escape routes, and annual plant germination sites for wildlife foraging habitat.<br>Shrub species component is typically no less than 5 percent or more than 25 percent of the total mixed-grass ground cover. Species composition includes fragrant mimosa, skunkbush sumac, smooth sumac, and inland New Jersey tea, all contributing to retaining or improving foraging and escape habitat for LPC. | Mechanically or with prescribed fire remove all undesirable trees on the mixed-grass prairie over the next 15 years after plan approval.<br>Within 10 years of plan approval, mark 25 to 50 percent of fences in suitable LPC habitat to minimize collisions of the bird with fences.<br>Over the next 15 years after plan approval, retain shrubby cover across the landscape in patches that are no less than 5 or more than 25 percent of the total mixed-grass area. | Trees in upland settings within landscapes suitable for LPC habitat should be targeted for eradication to reduce perches for raptors, predators of the LPC. |
| Shinnery oak | Shinnery oak vegetation type composition provides vegetation structure and height relationships necessary for ground nesting bird cover and brood rearing habitat for the LPC. Small areas of short structured herbaceous vegetation or patches of bare ground are available for LPC leks and courtship areas; these areas also provide wildlife travel | Mechanically or chemically remove 80 to 100 percent of undesirable trees in shinnery oak areas within 15 years of plan approval.<br>Within 10 years of plan approval, mark 25 to 50 | Trees in upland settings within landscapes suitable for LPC habitat should be targeted for eradication to |

| LPC | Desired Condition | Objectives | Guidelines |
|---|---|---|---|
| | corridors, escape routes, and annual plant germination sites for wildlife foraging habitat. Trees are nonexistent and collision risks from fences, etc., are minimal in areas important for recovery of LPC. | percent of fences in suitable LPC habitat to minimize collisions of the bird with fences. | reduce perches for raptors, predators of the LPC. |
| Sand sagebrush | The sand sagebrush species composition provides vegetation structure and height relationships necessary for ground nesting bird cover and brood rearing habitat. Small areas of short structured herbaceous vegetation or patches of bare ground are present for LPC leks and courtship areas. These patches also provide wildlife travel corridors, escape routes, and annual plant germination sites for wildlife foraging habitat. | Within 10 years of plan approval, mark 25 to 50 percent of fences in suitable LPC habitat to minimize collisions of the bird with fences. | |

### Lesser Prairie-chicken Environmental Consequences

*Alternatives B and C.* There are many plan components developed in alternatives B and C designed specifically to address the threats mentioned above. In general, implementation of plan components related to the improvement of watershed conditions, minerals and energy development, recreation, wildlife habitat improvement, and grazing management should result in positive effects to the LPC by directly improving habitat suitability and improving the overall health and diversity of ecological conditions across the landscape. Furthermore, plan components addressing resource damage caused by roads and recreational activities, such as OHV use, were also considered in the threats analysis. Implementation would likely result in improved habitat conditions, minimize the likelihood of take, support the recovery of the LPC, and would minimize the likelihood or magnitude of direct and indirect adverse effects, with many plan components developed specifically to improve habitat for LPC. Therefore, under alternatives B and C, there would be no loss of viability or trend toward future listing.

### Lesser Prairie-chicken on Mixed-grass Prairie Environmental Consequences

Table 10 provides a comparison by alternative of acreage of LPC habitat in the specific vegetation type.

**Table 10. Anticipated acreage of LPC habitat in mixed-grass prairie type by alternative over the life of the plan**

| Species | MA | Current Acreage | Total Suitable Acres by Alternative | |
|---|---|---|---|---|
| | | | A | B and C |
| Lesser Prairie-chicken | BKMC | 9,940 to 10,620 (88 to 94%) | 7,910 to 9,940 (70 to 88%) | 10,170 to 10,850 (90 to 96%) |

*Alternative A.* Native and nonnative invasive tree encroachment on mixed-grass prairie would degrade potential and suitable habitat for LPC due to avoidance behavior by the bird to habitat with tall vertical structures such as trees. Trees provide perches for raptors, predators of the LPC. Implementation of alternative A would result in greater viability risks to the LPC and may result in Federal listing.

*Alternatives B and C.* Implementation would achieve the following outcomes. Desired vegetation structure and species composition of the mixed-grass prairie across the landscape would enhance habitat by reducing the presence of undesirable invasive trees. The enhanced vegetation structure and species composition of mixed-grass prairie would transition potential LPC habitat to suitable habitat. Removal of undesirable trees on the mixed-grass prairie on the Grasslands could result in less perching and nesting habitat for raptors that prey on the LPC.

The mixed-grass species composition would increase vegetation structure and height relationships necessary for ground nesting bird cover and brood rearing habitat. Small areas of short structured herbaceous vegetation or patches of bare ground would increase for LPC leks and courtship areas. Small areas or patches of bare ground would become more available that provide wildlife travel corridors, escape routes, and annual plant germination sites for wildlife foraging habitat.

Management would aim for a shrub species component no less than 5 percent or more than 25 percent of the total mixed-grass ground cover. This would move the mixed-grass prairie toward desired vegetation structure and species composition. An additional benefit would be the retention or improvement of foraging and escape habitat for LPC.

LPC mortality caused by collision with fences would be reduced as a result of marking fences with visible plastic tabs in suitable mixed-grass prairie habitat.

#### Lesser Prairie-chicken on Shinnery Oak Environmental Consequences

Table 11 provides a comparison by alternative of acreage of LPC habitat in the specific vegetation type.

**Table 11. Anticipated acreage of LPC habitat in shinnery oak type by alternative over the life of the plan**

| Species | MA | Current Acreage | Total Suitable Acres by Alternative | |
|---|---|---|---|---|
| | | | A | B and C |
| Lesser Prairie-chicken | BKMC | 16,630−17,770 (88−94%) | 13,320−16,630 (70−88%) | 17,010−18,140 (90−96%) |

*Alternative A.* Mast (acorns) for LPC would be reduced due to reduction of shinnery oak acreage. Undesirable trees would degrade potential and suitable LPC habitat for the same reasons as mentioned in the mixed-grass prairie consequences. Implementation would result in greater viability risks to the LPC and may result in Federal listing.

*Alternatives B and C.* Undesirable tree removal would result in transition of potential habitat to suitable habitat and would provide a diversity of structural vegetative stages for LPC. Desired vegetation structure and species composition would improve ground nesting bird cover and LPC brood rearing habitat and would provide wildlife travel corridors and escape routes within the shrub cover. Small areas of short herbaceous vegetation or patches of bare ground would be available for LPC leks and courtship areas. Risks from collision with fences equipped with high visibility vinyl markers, etc., would be minimal in areas important for LPC recovery.

### Lesser Prairie-chicken and Black-tailed Prairie Dog on Sand Sagebrush Environmental Consequences

Table 12 provides a comparison by alternative of acreage of LPC and BTPD habitat in the specific vegetation type.

**Table 12. Anticipated acreage of LPC and BTPD habitat in sand sagebrush by alternative over the life of the plan**

| Species | MA | Current Acreage | Total Suitable Acres by Alternative | |
|---|---|---|---|---|
| | | | A | B and C |
| Lesser Prairie-chicken | KRB | 22,650 (100%) | ≤ 22,650 (≤ 100%) | 22,650 (100%) |
| Black-tailed Prairie Dog | KRB | 230 to 2,300 1 to 10% | 230 to 2,300 or (1 to 10%) | < 230 to 2,300 or (< 1 to 10%) |

*Common to All Alternatives.* Implementation would provide a diversity of structural vegetative stages for ground nesting birds. Implementation of any of the alternatives would result in no loss of viability or trend toward future listing of LPC.

*Alternative A.* Due to no defined targets for long-term maintenance of vegetative structure and species composition, this alternative would present various outcomes. A trend of higher shrub and tall vegetation component percentages would limit or curtail BTPD expansion. Conversely, conditions that expand early successional stage vegetation development or the reduction of shrub component percent of total vegetation would produce more potential or suitable BTPD habitat, thus, the comparison by alternatives above would produce uncertain outcomes and presents unpredictable consequences.

*Alternatives B and C.* Management direction would move toward desired vegetation structure and species composition, accomplished through well-defined targets for this vegetation type. The outcome would be of benefit to habitat for wildlife native to this vegetation type. A diversity of structural vegetative stages for the LPC would be produced, including leks and courtship areas, and would result in development of more corridors and escape routes for general wildlife native to this vegetation type, benefitting numerous species. Conversely, the achievement of desired vegetation structure and species composition would tend to limit or curtail BTPD expansion; thus, the comparison by alternatives above would produce uncertain outcomes and presents unpredictable consequences.

### Black-tailed Prairie Dog, Mountain Plover, and Swift Fox on Shortgrass Prairie Plan Components

Threats to the BTPD also impact habitat for the plover and fox.

Threats identified are:

- recreational shooting,
- habitat degradation and fragmentation,
- disease, and
- predation.

Plan components in alternatives B and C, developed to address the threats to BTPD, Mountain Plover, and swift fox are:

**Desired Conditions**

- Low structured vegetation representative of the early successional stage of shortgrass prairie is available for BTPD, a keystone[7] species, to colonize. The colonies provide habitat for swift fox and Mountain Plover.
- Habitat for at least one BTPD complex (a group or cluster of colonies) is available for potential future reintroduction to recover the endangered black-footed ferret, a predator dependent on the BTPD; impacts from plague outbreaks to BTPDs and potential reintroduced black-footed ferrets are minimal.

**Objective**

- Swift fox: Provide two to four arrays (groups of six structures spaced no more than 550 yards apart) of artificial escape structures per 640 acres to improve escape cover for swift fox. Structures will be placed in suitable shortgrass prairie habitat with loamy soils on slopes less than 3 percent and along ridgetops, knolls, or the tops of rolling hills within 15 years after plan approval.

**Guideline**

- Swift fox: Improving habitat and maintaining corridors for swift fox should be accomplished through timely burning, mowing, livestock grazing, and seeding.

### Black-tailed Prairie Dog, Mountain Plover, and Swift Fox on Shortgrass Prairie Environmental Consequences

These three species are considered together, as the BTPD is a keystone species. Table 13 provides a comparison by alternative of acreage of BTPD, Mountain Plover, and swift fox habitat in the specific vegetation type.

**Table 13. Anticipated acreage of BTPD, Mountain Plover, and swift fox habitat in shortgrass prairie and inclusion by alternative over the life of the plan**

| Species | MA | Current Acreage | Total Suitable Acres by Alternative | |
|---|---|---|---|---|
| | | | A | B and C |
| Black-tailed prairie dog | KRB | 50,930 (28%) | 54,570 to 58,210 (30 to 32%) | 54,570 to 58,210 (30 to 32%) |
| Mountain Plover | KRB | 50,930 (28%) | 54,570 to 58,210 (30 to 32%) | 54,570 to 58,210 (30 to 32%) |
| Swift fox | KRB | 181,900 (100%) | 181,900 (100%) | 181,900 (100%) |

[7] A keystone species has a large overall effect on community or ecosystem structure or function, and this effect is disproportionately large relative to its abundance (Power et al. 1996).

*Common to All Alternatives.* The expansion of BTPD colonies would result in increased areal extent of early successional stage shortgrass prairie, thus increasing nesting/foraging areas for Mountain Plover and an increased prey base to support swift fox.

Implementation of any alternative would impact the species listed in the table above, but would not result in a trend toward Federal listing or loss of viability.

*Alternatives B and C.* Targets for desired vegetation structure and species composition would result in further expansion of BTPD areal extent, thus improving foraging habitat for swift fox as a result of expansion of the prey base. A further consequence would be the protection and improvement of nesting/foraging areas for Mountain Plover. Viability of swift fox would be improved by providing escape structures.

#### Plains Leopard Frog on Shortgrass Prairie Playa Inclusions, Cottonwood-Willow Riparian (excluding the Canadian River) and Canyon Lowlands, Cottonwood-Willow Riparian on Canadian River Wildlife and Habitat Plan Components

The threat to plains leopard frog is:

- habitat degradation

Plan components developed in alternatives B and C to address the threat is:

**Desired Conditions**

- The cottonwood and willow riparian areas provide habitat for a diverse mix of native grasses and forbs adapted to abrupt fluctuations in moisture regimes. This habitat occurs in the herbaceous portion of riparian areas. The meander scars and depressions in the riparian areas that retain water part or all year provide habitat for plains leopard frog.
- The integrity of the clay seals of playas is maintained and free from human influence. Playas altered through the construction of dugout pits are restored to their natural hydrologic function.

**Objectives**

- Hydrologic functions are restored on 100 percent of altered and pitted playa lakes to better support their inherent ecological qualities and provide for wildlife habitat within 15 years of plan approval.
- Restore a minimum of 50 percent of the seasonal depressional wetlands that exhibit soil compaction and erosion within 10 years of plan approval.

**Guideline**

- Activities should be restricted from playa lakes that would adversely impact the water holding ability or capacity, and natural hydrologic function should be restored to those that have been altered.

### Plains Leopard Frog on All Habitats Environmental Consequences

Table 14 provides a comparison by alternative of acreage of plains leopard frog habitat in the specific vegetation type.

**Table 14. Anticipated acreage of plains leopard frog habitat by alternative over the life of the plan**

| Species | MA | Current Acreage | Total Suitable Acres by Alternative | |
|---|---|---|---|---|
| | | | A | B and C |
| **Playa Inclusion in Shortgrass Prairie** | | | | |
| Plains leopard frog | KRB | 1,820−5,460 (100%) | 1,820−5,460 (100%) | 1,820−5,460 (100%) |
| **Cottonwood-Willow Riparian excluding Canadian River** | | | | |
| Plains leopard frog | KRB | 1,370 (100%) | 1,370 (100%) | 1,370 (100%) |
| **Canyon Lowlands, Cottonwood-Willow Riparian on Canadian River** | | | | |
| Plains leopard frog | KRB | 1,500 (100%) | ≤ 1,500 (≤ 100%) | 1,500 (100%) |

*Common to All Alternatives.* All alternatives would result in some diversity of vegetative structural stages and composition, thereby providing some habitat necessary for plains leopard frog. Improved habitat in and around the playa inclusions would result from restoration of altered playa basins, thereby allowing longer presence and larger areal extent of surface water for plains leopard frog. Implementation of any alternative may impact the plains leopard frog, but would not result in a trend toward Federal listing or loss of viability.

*Alternative A on Cottonwood-Willow Riparian in All Areas.* Implementation would have no defined targets for long-term maintenance of riparian species composition or structure. The consequence of no defined targets of early, mid, and late seral stage development would tend to have either no affect or degrade the diverse habitat of the riparian community for the habitat of plains leopard frog.

*Alternatives B and C.* Implementation would achieve a defined structure and composition outcome for the cottonwood-willow riparian vegetation in all areas, with additional focus on early seral stage habitat development including presence of snags and woody debris in the streambeds and in the riparian area benefiting plains leopard frog.

*Alternative C.* Same as alternative B except wilderness designation would delay achievement of desired vegetation structure and species composition outcomes because of limitations on use of motorized management tools, thereby delaying benefits to plains leopard frog.

## Migratory Birds

Section 3(e) of Executive Order (EO) 13186 requires that Federal agencies design migratory bird habitat and population conservation principles into agency plans and planning processes, and coordinate with other agencies and non-Federal partners in planning efforts.

The viability analysis process described in the "Species Viability" section included consideration of the U.S. Fish and Wildlife Service National Birds of Conservation Concern (NBCC) in accordance with the International Migratory Bird Act. The appropriate bird conservation regions (BCR) identify NBCC species that either migrate through or breed in the planning area. Ecosystem components (including vegetation type and structure and water availability) were evaluated for sustainability and were primary factors used to determine a species' viability. All species were evaluated in the coarse filter/fine filter evaluations, and viability risks were determined from availability and condition of individual species' habitat, population evaluation, and effects from Grasslands management actions.

## Affected Environment

The bird conservation regions (BCR) defined by the USFWS applicable to the Grasslands are listed in table 15.

**Table 15. National Birds of Conservation Concern associated with Grasslands habitat**

| BCR 18 (Shortgrass Prairie) Kiowa and Rita Blanca Management Area | BCR 19 (Central Mixed-Grass Prairie) Black Kettle McClellan Creek Management Area |
|---|---|
| **Common Name** | |
| Lesser Prairie-chicken (a) | Lesser Prairie-chicken (a) |
| Bald Eagle (b) | Little Blue Heron |
| Golden Eagle | Mississippi Kite |
| Prairie Falcon | Bald Eagle (b) |
| Snowy Plover (c) | Swainson's Hawk |
| Mountain Plover | Black Rail |
| Upland Sandpiper | Snowy Plover (c) |
| Long-billed Curlew | Mountain Plover (nb) |
| Burrowing Owl | Solitary Sandpiper (nb) |
| Lewis's Woodpecker | Upland Sandpiper |
| Willow Flycatcher (c) | Long-billed Curlew |
| Bell's Vireo (c) | Hudsonian Godwit (nb) |
| Sprague's Pipit (nb) | Marbled Godwit (nb) |
| Lark Bunting | Buff-breasted Sandpiper (nb) |
| McCown's Longspur | Short-billed Dowitcher (nb) |
| Chestnut-collared Longspur | Red-headed Woodpecker |
| | Scissor-tailed Flycatcher |
| | Loggerhead Shrike |

| BCR 18 (Shortgrass Prairie) Kiowa and Rita Blanca Management Area | BCR 19 (Central Mixed-Grass Prairie) Black Kettle McClellan Creek Management Area |
|---|---|
| | Bell's Vireo (c) |
| | Sprague's Pipit (nb) |
| | Cassin's Sparrow |
| | Lark Bunting |
| | Henslow's Sparrow |
| | Harris' Sparrow (nb) |
| | McCown's Longspur (nb) |
| | Smith's Longspur (nb) |
| | Chestnut-collared Longspur (nb) |

Key: (a) ESA candidate; (b) ESA delisted; (c) non-listed subspecies or population of threatened or endangered species; (d) MBTA protection uncertain or lacking; and (nb) non-breeding in this BCR.

Individual migratory bird species (and overwintering habitats) are not addressed directly in the plan alternatives, given the strategic nature of plan revision, but many are included as species considered in risk assessment. Most species habitats would be accommodated indirectly through vegetation treatments that target vegetation structure and species composition.

The NBCC species (Lesser Prairie-chicken and Mountain Plover) that were determined to have habitat or population issues that Grasslands management could affect were brought forward for further analysis in the species viability determination process. Affected environment and environmental consequences for these species are addressed in the "Species Viability" section.

### Environmental Consequences to Migratory Birds

*Alternative A.* This alternative does not have direction for desired vegetation structure and species composition, whereas alternatives B and C do. Implication is that better quality habitat for migrants would be afforded by alternatives B and C.

*Alternatives B and C.* These alternatives have plan components for Grassland restoration in vegetation and habitat associated with species that have viability high at-risk concerns. Table 16 lists the NBCC specific to the BCR that overlays the Grasslands MA and vegetation type.

**Table 16. National Birds of Conservation Concern with viability high at-risk associated with Grasslands habitat**

| Common Name | Species and Habitat Needs |
|---|---|
| **BCR 18 (Shortgrass Prairie) Kiowa and Rita Blanca MA and BCR 19 (Central Mixed-Grass Prairie) Black Kettle McClellan Creek MA** | |
| Lesser Prairie-chicken (a) | Plan components described in the "Wildlife Threatened and Endangered" section and the "Species Viability" section address LPC habitat needs. |
| Mountain Plover | Plan components described in the "Species Viability" section for BTPD address the habitat needs for Mountain Plover. |

Key: (a) ESA candidate

The Grasslands have coordinated with other agencies and nongovernmental organizations (NGOs) that manage and/or regulate migratory birds and habitat. The Audubon Society has designated two Audubon important bird areas (IBAs): Sauz Creek and Perico Creek on the KRB MA. Playa Lakes Joint Venture, a nongovernmental organization, was involved in stakeholders scoping meetings as well. Section line surveys conducted by the Rocky Mountain Bird Observatory provide long-term trend population data. The USFWS administers breeding bird surveys and there are four in place on the Kiowa NG which provide population trend data.

*Alternatives B and C.* From analysis of breeding bird survey data and viability analysis, fine filter plan component objectives and guidelines were developed for the LPC and Mountain Plover.

### Eagles

Under the authorities of 50 CFR Part 22, the Bald Eagle and Golden Eagle are protected by the Bald and Golden Eagle Protection Act (Eagle Act) and the Migratory Bird Treaty Act (MBTA). The MBTA and Eagle Act protect Bald and Golden Eagles from a variety of harmful actions and impacts. The USFWS developed National Bald Eagle Management Guidelines to advise land managers under what circumstances the protective provisions of the Eagle Act may apply to their activities. A variety of human activities can potentially interfere with eagles, affecting their ability to forage, nest, roost, breed, or raise young. The guidelines are intended to help minimize such impacts to Bald Eagles, particularly where they may constitute “disturbance,” which is prohibited by the Eagle Act.

The Eagle Act (16 U.S.C. 668-668c) enacted in 1940, as amended, prohibits anyone, without a permit issued by the Secretary of the Interior, from “taking” Bald Eagles, including their parts, nests, or eggs.

The act provides criminal and civil penalties for persons who “take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle... [or any golden eagle], alive or dead, or any part, nest, or egg thereof.”

The act defines “take” as “pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb.” “Disturb” means to agitate or bother a Bald or Golden Eagle to a degree that causes, or is likely to cause, based on the best scientific information available:

- injury to an eagle,
- a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or
- nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior.”

In addition to immediate impacts, this definition also covers impacts that result from human-induced alterations initiated around a previously used nest site during a time when eagles are not present, if upon the eagle’s return, such alterations agitate or bother an eagle to a degree that injures an eagle or substantially interferes with normal breeding, feeding, or sheltering habits and causes, or is likely to cause, a loss of productivity or nest abandonment.

## Affected Environment

Bald Eagles are not known to occur on the KRB NGs, but a nest is located adjacent to a Rita Blanca unit. Typical habitat includes large trees on cliffs or pinnacles, usually near rivers, streams, or lakes. The Bald Eagle is known to inhabit Lake McClellan and Lake Marvin in Texas on the BKMC NGs in winter roost and foraging areas. In winter, they use dominant trees that provide a good view of the surroundings and are close to a food source such as fish and carrion.

## Environmental Consequences

*Alternative A.* This alternative would have plan components addressing consultation, protection, and monitoring of Bald Eagle roosting and foraging habitat. The Bald Eagle is no longer listed under the Endangered Species Act. The protection and monitoring components are carried forward in like fashion under alternatives B and C or are specified by law under the Bald and Golden Eagle Protection Act.

*Alternatives B and C.* These alternatives have plan components that minimize "take" as described in table 17.

There would be no programmatic take of eagles under any of the alternatives.

**Table 17. Alternatives B and C plan components that minimize eagle take**

| Resource Area | Plan Component |
|---|---|
| Minerals and energy development, oil and gas leasing standards | The timing limitation for Bald Eagle within 0.25 mile of known roosting sites is in effect from November 1 to March 31. |
| Mixed hardwood riparian | Mature hardwoods, shrubby understory or early successional growth, and woody debris as well as diverse riparian herbaceous vegetation on the margins of lakes or along stream sides are present to provide winter roosts for Bald Eagle. |
| Mixed hardwood riparian | Bald Eagle roosts should be protected by retaining, developing, or preserving mature trees and old growth cottonwood stands, particularly within ½ mile of lakes. |
| Cottonwood-willow riparian | Populations of native woody species (particularly the long-term presence of mature cottonwood stands and areas with regenerating cottonwood and willow saplings) provide habitat for wildlife species such as Bald Eagle. |
| Cottonwood-willow riparian | Bald Eagle roosts and nest sites should be protected by retaining, developing, or preserving mature trees and old-growth cottonwood stands, particularly within ½ mile of water. |
| Canyon lowlands and Canadian River riparian | Populations of native woody species, particularly the long-term presence of mature cottonwood stands and areas with regenerating cottonwood and willow saplings, provide habitat for wildlife species such as the Bald Eagle. |

## Management Indicator Species

### Summary

The National Forest Management Act (NFMA) regulations require that "Fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired nonnative vertebrate and invertebrate species in the planning area." The transition provision, 36 CFR 219.17(b)(3), of the 2012 Planning Rule (Vol. 77, No. 68/April 9, 2012) allows use of the

provisions of the 1982 Planning Rule to implement the NFMA requirement that management indicator species (MIS) be identified as part of the forest plan. MIS serve multiple functions in forest planning: focusing management direction developed in the alternatives; providing a means to analyze effects among alternative on biological diversity; and serving as a reliable feedback mechanism during forest plan implementation. The latter is accomplished by monitoring population trends in relationship to habitat changes (1982 rule provision 219.19(a)(6)).

Management indicator species is a concept adopted by the Agency to serve, in part, as a barometer for species viability at the Grasslands level. The role of MIS in meeting viability mandates complements that of several other approaches, particularly management of sensitive species.

The NFMA regulations suggest that several categories be considered when selecting MIS. The categories listed under 1982 Rule Provision 219.19(a)(1) are:

- Endangered and threatened plant and animal species identified on state and Federal lists,
- Species commonly hunted, fished, or trapped,
- Nongame species of special interest, and
- Species with special habitat needs that may be influenced significantly by planned management programs.

As a starting point, a comprehensive list of species (including plant, macro-lichen, bird, insect, and animal species) that are found in Texas, New Mexico, and Oklahoma was developed from multiple sources. The list of potential MIS considered plants and animals and common species in the ecological community of interest were emphasized. The following set of criteria was used in the selection process.

- Federally and state listed endangered and threatened plant and animal species that occur in the planning area.
- Species with special habitat needs that may be influenced significantly by planned management activities. Keystone species and ecological engineers (e.g., BTPD) could be included for consideration in this category.
- Species that are commonly hunted, fished, or trapped and occur in habitats likely to be influenced by planned management activities.
- Nongame species of special interest and occur in habitats likely to be influenced by planned management activities.
- Plant or animal species whose population changes are believed to indicate the effects of management activities on other species of selected major biological communities or on water quality. Select ecological indicators only if scientific evidence exists confirming that measurable changes in these species would indicate trends in the abundance of other species or the conditions of biological communities they are expected to represent (FSM 2621.1).

Research for each species life history and population information was gleaned from scientific references; Grasslands biologists; Oklahoma, Texas, and New Mexico wildlife agency biologists; and U.S. Fish and Wildlife Service biologists.

The list was modified through review, correspondence, and/or personal contact with teams developed for each respective state. The teams identified the constant biologic relationships between the species and characteristics of the habitat features within the vegetation type. These relationships were identified by one or more factors including nesting requirements, breeding habitat, food, and cover requirements or other biologic relationships. From the resulting list, the teams considered the selection of which species best represented the desired condition for the vegetation type that best meets all the above criteria. Table 18 presents the discussion and conclusion, representing the selected MIS.

**Table 18. Summary of Management Indicator Species Team discussion**

| Scientific Name | Common Name | Vegetation Type | Discussion and Conclusion |
|---|---|---|---|
| *Sialia currucoides* | Mountain Bluebird | Pinyon-juniper | Selected as Grassland plan MIS for pinyon-juniper woodland. The Mountain Bluebird is a cavity nester that is indicative of all seral stages of pinyon-juniper. It is easy to detect and is present on existing breeding bird survey (BBS) routes on the Kiowa NG. |
| *Athene cunicularia hypugaea* | Burrowing Owl | Shortgrass prairie | Selected as Grassland plan MIS for shortgrass prairie. The Burrowing Owl represents the presence, distribution, and size of BTPD colonies. Good data is available for the KRB NGs from New Mexico State University and New Mexico Department of Game and Fish (NMDGF). It is easy to detect. |
| *Meleagris gallopavo intermedia* | Rio Grande Turkey | Mixed hardwood riparian | The Rio Grande Turkey was retained as MIS. In the 1985 Forest plan, the turkey is MIS for eastern riparian habitat. Rio Grande Turkey habitat is well represented by abundant roosting trees and areas available for foraging and nesting in the understory of the mixed hardwood riparian habitat type. It is easy to detect. |

The three MIS selected for this FPEIS analysis were Rio Grande Turkey in mixed hardwood riparian, Burrowing Owl on early successional stages of shortgrass prairie, and Mountain Bluebird on all successional stages of pinyon-juniper.

## Affected Environment

*Rio Grande Turkey−See "Vegetation" section, "Mixed Hardwood Riparian for Affected Environment" description:* Rio Grande Turkey, MIS for mixed hardwood riparian and an important game species, utilizes all structural stages for roosting, brood rearing, foraging, and escape cover, and is common in this vegetation type. As of 2008, total acres of suitable habitat for Rio Grande Turkey is the total area of mixed hardwood riparian vegetation, about 1,950 acres.

*Burrowing Owl−See "Vegetation" section, "Shortgrass Prairie and Inclusions for Affected Environment" description:* Optimum habitat is typified by shortgrass vegetation and presence of fresh, small mammal burrows, especially those of prairie dogs. It is found in open grasslands, sometimes in open areas such as vacant lots near human habitation (e.g., campuses, airports, golf courses, perimeter of agricultural fields, banks of irrigation canals). Threats to burrowing owls include habitat loss, indirect losses due to decline of prairie dogs, and direct losses to predators, toxins, and incidental shooting. Because of their strong dependence on active prairie dog colonies for breeding habitat, long-term persistence of well connected, large, active prairie dog colonies is critical to the persistence of burrowing owls. As of 2008, total acres of suitable habitat for Burrowing Owl on shortgrass prairie vegetation was about 50,930 acres.

*Mountain Bluebird−See "Vegetation" section "Pinyon-Juniper and Juniper Grasslands Inclusion for Affected Environment" description:* Mountain Bluebird utilizes all successional stages of pinyon-juniper, including the late successional stages, for cavity nesting on the Kiowa NG. Total acres of suitable habitat is the total area of pinyon-juniper and juniper grasslands vegetation, about 21,700 acres as of 2008.

## Environmental Consequences

***Rio Grande Turkey Plan Components.*** Unlike alternative A, alternatives B and C have plan components directly related to Rio Grande Turkey habitat that influence the consequences. Those plan components are as follows:

**Desired Condition**

Mature hardwoods, shrubby understory, or early successional growth, and woody debris as well as diverse riparian herbaceous vegetation on the margins of lakes or along streamsides are present to provide roost, feeding, and nesting habitat for the Rio Grande Turkey.

**Objective**

Mechanically or chemically remove 100 percent of eastern redcedar around roost trees in cottonwood galleries, generally within the mixed hardwood type, within 10 years of plan approval to benefit the Rio Grande Turkey.

**Guideline**

Timing of prescribed fire or other vegetation treatments should consider adverse consequences to ground nesting birds such as the Rio Grande Turkey.

***Rio Grande Turkey Environmental Consequences.*** Table 19 provides a comparison by acres of habitat.

**Table 19. Anticipated acreage of Rio Grande Turkey habitat in mixed hardwood riparian by alternative over the life of the plan**

| Species | MA | Current Acreage | Total Suitable Acres by Alternative | |
|---|---|---|---|---|
| | | | A | B and C |
| Rio Grande Turkey | BKMC | 1,950 (100%) | 975 to 1,950 (50 to 100%) | 1,950 (100%) |

*Alternative A.* More intense and hotter fires caused by fuels buildup from lack of planned fire would reduce the number of mature deciduous trees, thereby eliminating roost areas for the Rio Grande Turkey.

*Alternatives B and C.* Mixed hardwood riparian vegetation type would move toward reference condition for vegetation structure as a consequence of implementing more clearly defined targets for species composition and structure. More diversity of structural stages in the mixed hardwood riparian ecosystem would improve habitat for the Rio Grande Turkey by providing roosting trees, foraging areas, and nesting and brood raising areas in the early- and mid-successional stages.

***Burrowing Owl Plan Components.*** Unlike alternative A, alternatives B and C have the following plan components for shortgrass prairie that address habitat for the Burrowing Owl.

**Desired Conditions**

Low structured vegetation representative of the early successional stage of shortgrass prairie is available for BTPD (a keystone species) to colonize. The colonies provide habitat in the early successional stage of shortgrass prairie specific vegetation provides requisite habitat for the Burrowing Owl.

Habitat for at least one complex of BTPD colonies is available for potential future reintroduction to recover the endangered black-footed ferret, a predator dependent on the BTPD; impacts from plague outbreaks to BTPDs and potential reintroduced black-footed ferrets are minimal.

**Guideline**

Prescribed fire and targeted grazing of suitable BTPD habitat should occur only on loamy uplands, loamy plains, limey uplands, alkaline plains, loamy bottomlands, basalt loam, and clayey soils on 0 to 5 percent slopes.

***Burrowing Owl Environmental Consequences.*** Table 20 provides a comparison by alternative of acres of Burrowing Owl habitat.

**Table 20. Anticipated acreage of Burrowing Owl habitat in shortgrass prairie and inclusion by alternative over the life of the plan**

| Species | MA | Current Acreage | Total Suitable Acres by Alternative | |
|---|---|---|---|---|
| | | | A | B and C |
| Burrowing Owl | KRB | 50,930 (28%) | 54,570 to 58,210 (30 to 32%) | 54,570 to 58,210 (30 to 32%) |

*Common to All Alternatives.* The expansion of Forest Service sensitive species, BTPD colonies would result in early successional shortgrass prairie wherever they occur. The increased areal extent of early successional stage shortgrass prairie would accommodate an increase in suitable habitat for the Burrowing Owl.

The Grasslands are cooperating with the New Mexico, Oklahoma, and Texas offices of Wildlife Services, USDA APHIS, in a memorandum of understanding that addresses sylvatic plague disease in mammals occurring on the shortgrass vegetation type for the purposes of protection of human health, other wildlife resources, and boundary control.

The Grasslands are cooperating, through a memorandum of understanding involving Federal agencies of the Multi-State Conservation Plan for the BTPD to achieve the conservation and management of BTPDs and their habitat.

Implementation of any of the alternatives would impact the Burrowing Owl but would not result in a trend toward Federal listing or loss of viability.

*Alternative A.* This alternative does not have direction for desired vegetation structure and species composition that would enhance habitat for Burrowing Owl. This would potentially degrade the amount of suitable habitat through less expansion of BTPD colony areal extent.

*Alternatives B and C.* Targets for desired vegetation structure and species composition would result in further expansion of BTPD areal extent, thus improving habitat for Burrowing Owl.

***Mountain Bluebird Plan Components.*** Alternatives B and C have the following plan components for supporting the pinyon-juniper vegetation type and by association, Mountain Bluebird habitat.

**Desired Condition**

Complete representation of all successional stages and desired vegetation structure and species composition of pinyon-juniper, provides requisite habitat for the Mountain Bluebird.

**Objectives**

Over the life of the plan, burn and/or thin 5 to 10 percent of the pinyon-juniper to maintain successional stage conditions and increase understory components in the pinyon-juniper woodland.

Mechanically, chemically, or with prescribed fire control 5 to 10 percent of native invasive plants (such as cholla and mesquite) annually.

Apply mechanical, chemical, and/or prescribed fire treatments to produce all middle to late structural stages that are proportionally present in the pinyon-juniper vegetation type with old growth representing 10 percent within 15 years of plan approval.

Over the life of the plan, retain large stands of pinyon-juniper as contiguous patches of no less than 40 acres on 10 percent of this vegetation type on a landscape scale.

Over the life of the plan, create openings in early and mid-successional stage stands that lack a good shrub or grass component on up to 20 percent of the pinyon-juniper vegetation type at a landscape scale.

**Guidelines**

When determining size of openings in early- and mid-successional stage pinyon-juniper stands, habitat requirements of management indicator species and big game species, and fuels reduction needs should be considered. Three to five of the largest diameter trees should be retained per acre in the openings.

All snags greater than 9 inches in diameter at the root crown should be retained.

At least two pieces of large 9 to 12 inches in diameter down woody material 8 to 10 feet long should be retained per acre.

Treatments or forest product removal should occur outside the nesting season (April 15$^{th}$ to July 31$^{st}$) or be preceded by surveys for nesting birds to avoid adverse consequences to nest sites.

***Mountain Bluebird Environmental Consequences.*** Table 21 provides a comparison by alternative of acres of Mountain Bluebird habitat in the pinyon-juniper and juniper grasslands vegetation.

**Table 21. Anticipated acreage of Mountain Bluebird habitat in pinyon-juniper and juniper grasslands inclusion by alternative over the life of the plan**

| Species | MA | Current Acreage | Total Suitable Acres by Alternative | |
|---|---|---|---|---|
| | | | A | B and C |
| Mountain Bluebird | KRB | 21,700 (100%) | 19,530 (90%) | 21,700 (100%) |

*Alternative A.* Implementation would allow silvicultural management, managed grazing, and planned fire to achieve management objectives but would provide an uncertain outcome due to no defined targets for vegetation structure, thus limiting early- and mid-seral stage development and, thereby, providing less habitat for the Mountain Bluebird.

*Alternatives B and C.* Because of explicit plan components for pinyon-juniper, implementation would result in a diversity of structural stages and composition in pinyon-juniper habitat for cavity nesting birds such as the Mountain Bluebird.

### Summary of Amount and Quality of MIS Habitat

MIS were evaluated for population trends and the amount and quality of habitat. Table 22 summarizes the results. The two consequences columns have symbols that represent potential consequences to MIS population and habitat from implementation of the respective alternatives. The following symbols represent environmental consequences to population, amount, and quality of habitat: (−) detrimental effect or less, (0) no effect or no change, (+) positive effect or increased areal extent or better quality.

**Table 22. Consequences to MIS population trends and consequences to amount and quality of habitat by alternative**

| Common Name | Viability Risk | Consequences to MIS Population Trends by Alternative | | | Consequences to Amount and Quality of Habitat by Alternative | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | A | B | C | A | | B | | C | |
| | | | | | Amount | Quality | Amount | Quality | Amount | Quality |
| **Mixed Hardwood Riparian** | | | | | | | | | | |
| Rio Grande Turkey | Low | − | + | + | **0** | − | **0** | + | **0** | + |
| **Shortgrass Prairie** | | | | | | | | | | |
| Burrowing Owl | Moderate | + | + | + | + | + | + | + | + | + |
| **Pinyon-Juniper** | | | | | | | | | | |
| Mountain Bluebird | Low | **0** | + | + | **0** | **0** | **0** | + | **0** | + |

In mixed hardwood riparian and pinyon-juniper vegetation, none of the alternatives provide a meaningful increase in amounts of habitat for Rio Grande Turkey and Mountain Bluebird. However, habitat would improve in alternatives B and C through provisions of maintaining or attaining all seral stages in the representative ranges of desired vegetation structure and species composition for the various MIS.

For Burrowing Owl, there is neither a change in amount or quality of habitat among alternatives.

## Cumulative Environmental Consequences to All Wildlife

Cumulative consequences are those consequences of foreseeable activities on non-Federal lands that, in conjunction with management activities likely to occur on the Grasslands, may intensify, negate, improve or otherwise affect the vegetation types, habitats, and species of the Grasslands. Below are considerations of consequences of activities that will likely occur on adjacent or nearby ownerships to the Grasslands. For purpose of analyses, the cumulative effects area is generally considered to be those non-Federal lands within a mile of the Grasslands' borders.

### Cumulative Consequences on Wildlife in General

*Common to all alternatives but only affecting the shortgrass prairie and sand sagebrush vegetation types on the KRB NGs.* Groundwater used for cropland irrigation on nearby private lands contributes to aquifer drawdown. There may be less water available for wildlife.

### Cumulative Consequences on Lesser Prairie-chicken and Black-tailed Prairie Dog

*Common to all alternatives and shortgrass prairie, sand sagebrush, mixed-grass prairie and shinnery oak vegetation types on the Grasslands.* Conversion of grassland to cultivated land on private lands would have cumulative environmental consequences that would likely be as follows:

Wildlife species displaced from grassland vegetation types on private land that have been altered or converted to cropland may be forced to compete for limited territories available in the vegetation types on the Grasslands, or leave the area altogether. Overall, habitat across the landscape, including the Grasslands, will become more fragmented for species of viability concern such as the LPC, resulting in declining populations.

Additional food sources from crop residue on adjacent private land would be available for wildlife residing on the Grasslands, depending on the home range of an individual species. This would benefit Grasslands wildlife.

There would be an increased probability of invasive species colonizing within the vegetation types of the Grasslands from seed sources originating from adjacent private lands.

BTPD colonies will be increasingly restricted to the KRB NGs, when and where conversion of grassland to cropland occurs on adjacent private lands.

There are about 109 linear miles of shelterbelts on non-Federal land within a mile of the BK NG border.

*Common to All Alternatives in Mixed-grass and Shinnery oak.* Off-Grasslands shelterbelts could compensate for any removal of undesirable native and nonnative invasive trees on the Grasslands with regard to perching and nesting habitat for raptors. However, off-Grasslands shelterbelts could have adverse effects on ground nesting birds or habitat such as that of the LPC due to the habitat shelterbelts provide for raptors.

#### Cumulative Consequences on Black-tailed Prairie Dog Colony Expansion on Private Lands

Some private landowners enroll in the Oklahoma Department of Wildlife Conservation Landowner Incentive Program Short and Mixed-grass Prairie Habitat Conservation and receive incentive payments for BTPD colony establishment. Lands adjacent to RB units in Oklahoma have potential to be enrolled, and expansion of prairie dog colonies on private lands could spill onto the Grasslands. It is unclear if New Mexico or Texas will develop such landowner assistance programs, but if they do, this same cumulative consequence could apply to the Kiowa NG in New Mexico and the portions of the RB NG in Texas.

BTPD expansion on private lands would have cumulative environmental consequences upon the shortgrass prairie vegetation type alternative as follows:

> *Common to All on Shortgrass Prairie and Sand Sagebrush Vegetation Types.* Expansion of prairie dog colonies on private lands would complement colony expansion on the Grasslands. An increase in prairie dog colonies on adjacent private lands would likely increase the prey base to support raptors and for the viability high at-risk species, swift fox. Prairie dog increases on adjacent private lands would increase the likelihood of success of a black-footed ferret reintroduction on the Grasslands; similarly, there could be an increase in nesting/foraging areas for the viability high at-risk species (Mountain Plover) and cover for the MIS (Burrowing Owl).

#### Cumulative Consequences on Lesser Prairie-chicken from Energy Development

There is increasing interest in wind energy development on private lands. As infrastructure transmission lines are developed to support wind energy generation, more wind farms will likely rise on lands near the Grasslands.

Wind energy development on private lands would have cumulative consequences.

*Common to All Alternatives.* Consequences to wildlife on mixed-grass prairie, sand sagebrush, and shinnery oak vegetation types would likely be as follows:

> Because of the LPC's avoidance behavior of tall structures (e.g., wind turbines, transmission poles), potential and suitable habitat for this species would likely decrease, making habitat on the Grasslands even more important.

*Common to All Alternatives.* Consequences to wildlife on all vegetation types would likely be as follows:

> The effect of wind turbines on private lands within a mile of the Grasslands could be detrimental to bats and birds occurring in all vegetation types.

## Invasive Species

Section 1502.2(b) of the National Environmental Policy Act provides for discussion of impacts in proportion to their significance. The environmental consequences in this section focus on the components of invasive species that are useful to the decision maker and the public. Additional information is in the "Noxious/Invasive Species Specialist Report" (USDA Forest Service 2011e).

### Affected Environment

Noxious/invasive species disrupt natural ecosystem functions and negatively affect both ecological and socioeconomic conditions. Noxious/invasive species can displace desirable native species, reduce the quality of wildlife habitat, damage riparian and watershed areas, increase wildfire risk, and increase erosion.

Before European settlement, there were no noxious/invasive plant species on the Grasslands. Disturbance factors such as periodic fire and grazing by wild ungulates kept native plants with invasive characteristics in check. Settlement introduced nonnative plant species and disrupted the natural fire cycle, allowing nonnative and native invasive plants to increase. Settlement of the Grasslands and increasing populations make it necessary to limit fire activity which allows native invasive plants to increase.

Introduction of invasive species has come from transportation of fugitive seed by motor vehicles and other sources. Riparian corridors have become colonized by invasive tree species such as saltcedar, currently infesting about 540 acres in Mills Canyon. Tree species not native to the BK NG, although native to Oklahoma, such as black locust, cover about 1,600 to 1,800 acres. Siberian elm and eastern redcedar are very prolific and have dispersed over the landscape altering the structure and composition of BK vegetation types.

Feral hogs are prolific, detrimental to soils and the structure and composition of vegetation types, and are expanding in all BK NG vegetation types.

### Environmental Consequences

*Common to All Alternatives.* An integrated pest management program would be implemented on the Grasslands to control invasive plant populations. Invasive species control would generally improve Grasslands aquatic and terrestrial wildlife habitat; however, in the potential wilderness area under alternative C, treatment options may be restricted, require waivers, or require the approval of the regional forester.

Implementation of saltcedar eradication would reduce evapotranspiration of the instream flow and enhance riparian habitat on the Canadian River within the potential wilderness area.

*Alternative A.* Where the current plan is silent, law, regulation, and policy and BMPs are used for guidance.

Shelterbelts would be maintained and sustained, thus supplying a source for undesirable native and nonnative invasive tree seed from species such as black locust, eastern redcedar, and Siberian elm.

*Alternatives B and C.* Implementation would provide clear management direction for effective noxious/invasive plant species control which would provide more benefit to soil condition, water quality, and wildlife habitat. Feral hog populations would be reduced Grasslands-wide.

### Cumulative Environmental Consequences

Some private ownership agriculture lands adjacent to the Grasslands have been undergoing mechanical, manual, and herbicide treatment for noxious invasive species for many years. This has been done to maintain the agriculture value and other property values. The Grasslands have a one-half mile weed treatment zone adjacent to the Grassland units as well.

Some private landholdings within the administrative boundary of BK have invasive species and tree encroachment issues that may not have the same eradication emphasis as does the Grasslands.

*Common to All Alternatives.* There would be less areal extent of invasive plant species on the Grasslands due to control efforts on private lands. Feral hog control, or lack thereof, would have commensurate consequences on the Grasslands.

As part of the interagency Canadian River saltcedar control program, efforts up and downstream of the Mill Canyon MA to eradicate saltcedar positively affect the riparian area by reducing seed sources of saltcedar.

*Alternative A.* Lack of invasive tree control on private lands would result in further degradation of potential and suitable habitat for the LPC.

*Alternatives B and C.* Lack of invasive tree control on private lands would further isolate and fragment Grasslands habitat.

The mutual benefit of concurrent invasive species control on the national grasslands and adjacent non-Federal land would be best realized under alternative B and least realized under alternative A in consideration of the environmental consequences of alternatives.

## Climate Change

Section 1502.2(b) of the National Environmental Policy Act provides for discussion of impacts in proportion to their significance. The environmental consequences in this section focus on the components of climate that are useful to the decision maker and the public. For more information, see “Appendix B: Southwestern Region Climate Change Trends and Potential Climate Change Strategies for Southwestern Region National Forests” in the draft Grasslands plan.

### Affected Environment

The affected environment is the entire Grasslands, which experience large fluctuations in climate conditions and extreme weather events such as prolonged droughts, flooding, hail, blizzards, tornadoes, and dust storms. Evaporation typically exceeds precipitation, and demands on surface water and aquifers are expected to increase as the gap between precipitation and evapotranspiration increases under the predicted Grasslands climate regime.

Grasslands average annual precipitation ranges from about 14 inches (Kiowa) to 29 inches (Black Kettle); average annual temperature ranges from about 50 °F (Kiowa) to 59 °F (Black Kettle). Climate data for specific locations on the Black Kettle and Kiowa NGs are displayed in tables 23 and 24, respectively.

**Table 23. Temperature, precipitation, and wind velocity on the Black Kettle NG**

| Month | Average Monthly High Temp (°F) | Average Monthly Low Temp (°F) | Mean Annual Precipitation (in.) | Average Wind Velocity (MPH) |
|---|---|---|---|---|
| January | 47.9 | 21.2 | 0.64 | NA |
| February | 54.5 | 26.1 | 0.95 | NA |
| March | 62.7 | 33 | 1.94 | 14.2 |
| April | 72.3 | 42.9 | 2.37 | 15.2 |
| May | 79.5 | 52.9 | 4.05 | 13.2 |
| June | 88.2 | 63 | 3.65 | 12.8 |
| July | 94.2 | 66.9 | 1.77 | 11.2 |
| August | 92.5 | 65.9 | 2.4 | NA |
| September | 84.5 | 57.7 | 2.64 | 11.4 |
| October | 74.3 | 45.4 | 1.98 | 12.6 |
| November | 59.4 | 32.4 | 1.23 | 13 |
| December | 49.2 | 24 | 0.84 | NA |
| | Average 71.6 | Average 44.3 | Total 24.5 | Average 12.7 |

Reydon, OK. Periods of record=1971−2000 (temperature, precipitation); 1994–2010 (wind). NA=data not available. http://climate.mesonet.org/county_climate/Products/CountyPages/roger_mills.html

**Table 24. Temperature, precipitation, and wind velocity on the Kiowa NG**

| Month | Average Monthly High Temp (°F) | Average Monthly Low Temp (°F) | Mean Annual Precipitation (in.) | Average Wind Velocity (MPH) |
|---|---|---|---|---|
| January | 47.9 | 20.1 | 0.28 | 11.9 |
| February | 51.1 | 22.6 | 0.35 | 12.4 |
| March | 57.4 | 27.7 | 0.73 | 13.1 |
| April | 66.7 | 36.8 | 1.25 | 14.4 |
| May | 74.8 | 45.9 | 2.31 | 13.2 |
| June | 84.4 | 55.3 | 1.91 | 12.9 |
| July | 88.2 | 60.2 | 2.65 | 11.2 |
| August | 86.4 | 59 | 2.35 | 10.2 |
| September | 79.4 | 51.5 | 1.68 | 11.3 |
| October | 69.4 | 40.5 | 1.1 | 11.8 |
| November | 57.1 | 28.5 | 0.49 | 11.8 |
| December | 48.9 | 21.4 | 0.38 | 12.1 |
| | Average 67.7 | Average 39.1 | Total 15.5 | Average 12.2 |

Clayton, NM. Period of record=1896−2010. http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?nm1887

### Environmental Consequences

*Common to All Alternatives.* Southern areas of the Great Plains (i.e., KRB and BKMC NGs) are projected to experience increased temperatures and decreased precipitation, similar to the Southwest (Karl et al. 2009). All alternatives would be subject to evolving Forest Service policy and directives on adapting to climate change.

*Alternative A.* Would not address climate change or mitigate climate change with adaptive response strategies.

*Alternatives B and C.* Implementation would have the same environmental consequences on the resources by responding to climate change effects through adaptive management of livestock, prescribed fire, and more carbon sequestration from harvesting solid wood products such as posts and poles through invasive species treatments. There would be more aquatic passage provision for aquatic organisms at road and stream crossings Grasslands-wide from management responses to potentially low flows as a result of climate change.

### Cumulative Environmental Consequences

*Common to All Alternatives.* Management of livestock, prescribed fire, and harvesting solid wood products would adjust by climate conditions; however, if grazing discontinued substantially on lands outside Grasslands management control, fuel loads have the potential to build and increase and intensify wildfire. The cumulative consequence would negate the ability of the Grasslands to use adaptive management as effectively.

## Needs for Change
## Topic 2: Managed Recreation

Managed recreation includes the following resource areas: scenery, recreation, nature-based tourism, heritage resources, special areas/areas of interest, and wilderness.

### Scenery

Section 1502.2(b) of the National Environmental Policy Act provides for discussion of impacts in proportion to their significance. The environmental consequences in this section focus on the components of the scenic resources that are useful to the decision maker and the public. Additional information is in the “Scenic Resources Specialist Report” (USDA Forest Service 2011f).

#### Affected Environment

The scenic resources and rural setting of the Grasslands strongly influence the experience of visitors. The Grasslands are generally characterized by a pastoral agricultural landscape from vast open grasslands of the KRB NGs to the rolling hills of the BK NG. Views from Grassland units often include homes, barns, tractors, trucks, windmills, cattle, stock tanks, fences, and other private ranchland features. Grasslands residents are accustomed to viewing these structures and features and consider them a highly valued part of the traditional landscape. Many visitors also have a deep appreciation of the rural character of the plains grasslands landscapes. The presence of farms and ranches contributes to the “sense of place” or “cultural identity” that these areas provide for residents and visitors alike. Scenic resources and scenic quality are important to local

residents and visitors as identified in the National Visitor Use Monitoring Survey. In the 2006 survey, 51.5 percent said that part of the purpose of their visit was to view wildlife or birds, and 47.5 percent stated that part of the purpose of their visit was to view scenery.

On the BKMC NGs, the many lakes, ponds, wetlands, and riparian areas complement the rolling red hills, shelterbelts, shinnery oak, and other vegetation interspersed with the cultivated fields on surrounding private lands. Trails are available to allow the public to view wildlife and enjoy these scenic resources. Actively producing oil and gas wells, as well as those that have been plugged and rehabilitated, are part of the BKMC NGs rural landscape, and not necessarily considered deviations from the desired landscape, but positive cultural features.

The KRB NGs areas greet the traveler with a vast expanse of undulating waving grass, punctuated by windmills and farmsteads. A large area on the RB NG called the “High Lonesome” typifies the prairie of lore. The High Lonesome is generally considered to be that part of Dallam County, Texas, from the Thompson Grove area, east to Sherman County. One of the most distinctive and beautiful landscapes on the Kiowa NG is Mills Canyon, with its mosaic of evergreen trees, red-rock cliffs, and the free flowing Canadian River. These features are unique to this part of the plains grasslands. There are two scenic byways, the Santa Fe Trail National Scenic Byway and La Frontera del Llano Scenic Byway, and a segment of the Santa Fe National Historic Trail in this part of the Grasslands. While there are several small (<2 acres) caliche extraction pits, most of them are retired and rehabilitated; they are not located in areas viewed from the byways or developed recreation sites.

Local communities are beginning to capitalize on the value of the scenery on the Grasslands. Scenic byways and other travel and tourism efforts are incorporating scenery as a way to attract visitors from outside. Protecting and highlighting scenic resources is becoming increasingly important to the Grassland counties in contributing to rural economic development.

The goal of visual management is to identify valued landscape characteristics and manage to protect them. Ninety-six percent of the Grasslands are assigned the visual quality objective (VQO) of “modification,” where the valued landscape character appears moderately altered and deviations begin to dominate; disruptive activities may occur on modification acreages. Only 4 percent of the Grasslands are assigned a VQO of “partial retention” where the valued landscape character appears slightly altered and deviations must remain visually subordinate. There are no VQOs of “preservation” or “retention” assigned to the Grasslands, where the management emphasis would maintain or enhance the valued landscape character. Table 25 shows the number of acres classified in partial retention or modification for each MA.

**Table 25. VMS classifications for visual quality from the 1985 plan**

| Management Area | Partial Retention (acres) | Modification (acres) |
|---|---|---|
| Black Kettle and McClellan Creek | 4,100 (around developed recreation sites and lakes) | 29,012 |
| Kiowa and Rita Blanca | 8,186 (Mills Canyon) | 222,656 |

## Environmental Consequences

*Common to All Alternatives.* Implementation of the 2012 travel management decision on the KRB NGs would minimize the impacts on scenic resources by prohibiting cross-country travel and

unauthorized road development which scar the landscape and disturb vegetation and wildlife habitat.

There is potential for additional oil and gas development. Alternative A (amendment 12 of the 1985 plan) would not allow surface occupancy for leasable minerals in a number of scenic areas including developed recreation sites, Mills Canyon, and the Santa Fe National Historic Trail. Amendment 12 would be carried forward into alternatives B and C. Oil and gas development may adversely affect scenic touring and economic development. However, many constituents consider the gas and oil developments to be part of the pastoral landscape and not a deviation from valued characteristics and would not have any consequence to the scenic resource.

*Alternative A.* Using the Visual Management System, most of the Grasslands would be managed for a VQO of modification, and there would be little emphasis on managing for visual quality. The scenic resource direction in the 1985 plan addresses visual quality as it relates to vegetation management and mineral exploration. For example, slash piles would be temporarily visible as a byproduct of vegetation management/invasive species treatments. This short-term activity would have limited consequences to visual quality; however, the VOQ of modification would allow visually disruptive activities to occur on the majority of the Grasslands.

Alternative A would provide no direction on wind energy development; however, there is potential for large industrial wind energy developments. This activity most likely would detract from areas that have been ranked as important or have a high concern level[8] for scenic quality such as the scenic byways and the Santa Fe National Historic Trail, and may result in lost opportunities for tourism and associated economic development.

*Alternatives B and C.* Using the Scenery Management System, a *high scenic integrity* level would be assigned to areas surrounding Lake Marvin, Lake McClellan, Mills Canyon, Sauz Creek, Sugar Loaf Mountain, Santa Fe National Historic Trail, the High Lonesome, and developed recreation sites. The majority of the Kiowa NG and small areas within the RB NG would be managed for *moderate scenic integrity*. Under this classification, the landscape appears slightly altered and deviations remain visually subordinate to the characteristic landscape. *Low scenic integrity* is proposed for about half of the RB NG and a small area on the Kiowa NG. Low scenic integrity refers to areas where the landscape appears moderately altered and deviations begin to dominate the landscape, this would be the equivalent of modification under the Visual Management System. In this area, resultant alterations would likely be large agricultural operations on adjacent lands and wind energy developments.

Additional guidelines would be proposed for mitigating visual impacts from oil and gas exploration and extraction, and other new energy or special use developments in areas of high scenic integrity including heritage sites, riparian areas, and wetlands. Taken into consideration during project planning and implementation, this would protect views and place emphasis on the vast horizon of the prairie.

Large industrial wind farms would be discouraged within the foreground views of areas of high scenic integrity. This would limit impacts on scenic resources and ensure that large vertical

[8] Concern levels are a measure used in the scenery inventory process, of the degree of public importance placed on the aesthetics of landscapes. Concern levels are assigned to travelways and use areas to describe three levels of interest in scenery: high (1), moderate (2), or low (3). Concern level 1 (high) is defined as “National and/or regionally important locations largely associated with recreation and tourism use.”

structures do not dominate views from developed recreation sites or other areas of high scenic integrity.

Proposed vegetation management practices may impact scenic resources. This includes removing shelterbelts in some locations on the BK NG. While all of these proposals can contain design elements and mitigation measures to meet the scenic integrity objectives, they could potentially affect the scenic quality of the landscapes. Projects with a tree harvest element would alter[9] the views for the long term, since trees are a prominent feature on the relatively flat grassland landscape.

*Alternative C.* Recommendation of the Canadian River PWA would provide management and enhancement of scenic quality. The recommendation would exclude Forest Road K600, the developed campground, and historic/interpretive site in the canyon. The wilderness recommendation and associated management would be consistent with the *high scenic integrity* objective for the area.

### Cumulative Environmental Consequences

The cumulative effects area includes adjacent public and private lands within the viewshed of concern level 1 roads, trails, and areas. Due to the fragmented nature of the Grasslands, additional development and management on adjacent lands have the potential to negatively impact scenic quality as seen from the Grasslands. There is a potential for large industrial wind energy and additional oil and gas development; these activities both off and on the Grasslands would impact scenic quality in areas such as the scenic byways and Santa Fe National Historic Trail.

## Recreation

Section 1502.2(b) of the National Environmental Policy Act provides for discussion of impacts in proportion to their significance. The environmental consequences in this section focus on the components of recreation that are useful to the decision maker and the public. Additional information can be found in the "Recreation Specialist Report" (USDA Forest Service 2011g).

### Affected Environment

Recreation opportunities on the Grasslands contribute to the quality of life enjoyed by residents and visitors alike. The Grasslands provide opportunities for dispersed recreation including hunting, fishing, camping, and hiking. Developed recreation, particularly the lake-based recreation complexes on the BKMC NGs, and the sites within Mills Canyon on the Kiowa NG, offer unique recreational opportunities for both residents and visitors to enjoy (USDA, Forest Service 2008).

*Recreation Opportunity Spectrum.* [10] ROS classes of "roaded natural" and "semiprimitive motorized" are currently assigned to the Grasslands. Roaded natural areas are outdoor settings

[9] Mitigations and controls on long-term alterations are not intended to restrict short-term impacts to scenery from activities such as fire management, vegetation management, or exploratory drilling.

[10] Recreation Opportunity Spectrum is a tool for recreation planning. The ROS process recognizes that people choose a specific setting for recreation activities in order to realize a desired experience. ROS provides a framework for defining the relationship between outdoor setting and recreational activities.

where there is an opportunity to affiliate with other users in developed sites. Within semiprimitive motorized areas, users have a moderate probability of experiencing solitude with a high degree of self-reliance and challenge in using motorized equipment.[11] The presence of state and county roads (access) was the primary factor in assigning these ROS classifications, and not necessarily the planned recreation management[12]. Within the Grasslands there are state, county, and NFS roads, and small spurs throughout the units. However, many receive little use. The flat terrain and minimal use of many roads reduce the influence they have on the recreational experience. Even with the roads, recreation users can experience a sense of remoteness, naturalness, and solitude in many locations.

The ROS acreages currently proposed for each MA by alternative follow in tables 26 and 27. The acreages for alternative A were assigned and compiled in the 1980s. The acreages for alternatives B and C were recently compiled as part of the planning process using GIS. Due to changes in land ownership, mapping technology, and rounding, the total acreage between alternative A and alternatives B and C will vary slightly. We recalculated the ROS acreages on KRB (02/16/12) for alternatives B and C to reflect the addition of RN acres in Mills Canyon to provide access to the "Rock Table" dispersed site within the IRA exclusion. We also recalculated all other ROS acres for alternative C. That recalculation resulted in reduced RN and SPM acres, and added SPNM where Road 600 crosses the river. See the "Recreation Opportunity Spectrum Maps" in appendix L, or "Recreation Suitability" in appendix H for the distribution of ROS assignments.

**Table 26. Black Kettle and McClellan Creek National Grasslands ROS classes (acres)**

| Alternative | Semiprimitive Nonmotorized | Semiprimitive Motorized | Roaded Natural | Rural |
|---|---|---|---|---|
| A | 0 | 3,583 | 29,529 | 0 |
| B | 0 | 28,695 | 4,064 | 36 |
| C | 0 | 28,695 | 4,064 | 36 |

**Table 27. Kiowa and Rita Blanca National Grasslands ROS classes (acres).**

| Alternative | Semiprimitive Nonmotorized | Semiprimitive Motorized | Roaded Natural | Rural |
|---|---|---|---|---|
| A | 0 | 161,942 | 68,900 | 0 |
| B | 8,121 | 220,016 | 688 | 1,409 |
| C | 8,212 | 219,955 | 658 | 1,409 |

[11] Roaded natural areas are predominantly natural with some site modifications that harmonize with the natural environment. Semiprimitive motorized areas are predominantly natural, lacking human modification, except when necessary for site protection.

[12] There are seven factors that are considered when assigning ROS classes: access, remoteness, naturalness, facilities and site management, social encounters, visitor impacts, and visitor management. Roads generally influence many of these factors, including access, remoteness, and social encounters. However, the Grasslands are heavily roaded due to the relatively flat terrain, grasslands vegetation, and grazing and other agricultural uses.

*Dispersed and Motorized Recreation.*[13] Hunting occurs throughout the Grasslands, except for within developed recreation and administrative sites. It is a major activity on the BK NG, attracting as many as 3,000 hunters from across the Nation during spring Rio Grande Turkey season. BK is one of the best public hunting areas in the Nation for Rio Grande Turkey and Northern Bobwhite Quail, although deer and small game hunting are also popular around the shelterbelts and clumps of other invasive trees. Fewer out-of-state residents hunt on the Kiowa NG due to limits on permits issued in New Mexico. Big game hunting on the Kiowa NG is popular for antelope and deer in northeast New Mexico, and to a limited extent on the RB NG. Cougar, mountain lion, black bear, and Barbary sheep occur in Mills Canyon. The Forest Service does not have any restrictions on BTPD shooting on the Grasslands. Each state manages BTPDs differently, and none of the states have an actual season for this activity. Fishing is popular on the lakes and ponds of the BKMC NGs and the Canadian River on the Kiowa NG; the Forest Service works with state agencies that stock the water bodies with fish. The projected trend is that hunting and fishing will remain a stable activity, with most activity taking place on the BK NG in Oklahoma (USDA Forest Service 2008).

Day hiking and dispersed camping (both motorized and nonmotorized) occur on the Grasslands. Mills Canyon is the most popular area for dispersed camping on the Kiowa NG, where families have been returning to favored sites among the cottonwoods in the canyon bottom and the juniper clusters on the rim. On the BK NG, dispersed camping most often occurs at the 32 designated dispersed sites that are accessed from open roads. Fire restrictions during drought shift use patterns from dispersed to developed sites.

The BKMC NGs currently contain about 13.7 miles of short hiking trails around the major recreation sites, each of which is less than 2 miles long. A need for additional trails has been identified, especially in Mills Canyon and near some of the developed recreation sites on the BK.

Driving motor vehicles off road (cross country) is currently allowed on the KRB NGs but has been prohibited on the BK NG since 1990. Off-road driving has resulted in user-created roads in Mills Canyon and other areas on the KRB NGs. The KRB NGs are currently undergoing a planning process in accordance with the 2005 Travel Management Rule (36 CFR 294) that would provide for a system of roads, trails, and areas designated for motor vehicle use. After these roads, trails, and areas are designated, motor vehicle use off the designated system would be prohibited, except as identified on the motor vehicle use map (MVUM). As of May 2012, the proposed action would result in approximately 227 miles of roads open to all vehicles and no motorized trails. BK designated roads and trails for motor vehicle use and published a MVUM for the district in 2007. BK has designated 35 miles of roads and 10 miles of motorized trails.

OHVs are frequently used for hunting throughout the Grasslands. MC NG currently provides the only area designated for motorcycles and all-terrain vehicles (ATVs).

Motorized users are more prevalent than back-country users in the Mills Canyon area.

[13] Dispersed recreation includes all recreation activities that take place away from developed recreation sites such as campgrounds and picnic areas. This includes dispersed camping (where no facilities are provided), hunting, fishing, hiking, horseback riding, and bird watching. Trail use for hiking, horseback riding and motorized recreation are considered to be dispersed recreation. Occasional recreation special use permits are requested and permitted. These include group activities such as Mountain Man Rendezvous and bicycle events.

*Developed Recreation.*[14] The Grasslands feature two major recreation complexes in Texas designed around highly scenic reservoirs—McClellan Creek (1,449 acres) and Lake Marvin Recreation Areas (576 acres). The BK NG features three other popular lake-based recreation areas—Spring Creek, Skipout, and Black Kettle—which provide water-based recreational opportunities not usually found in the Grasslands region. These lakes attract high numbers of visitors, with peak use occurring during the spring and fall hunting seasons, and hot summer months. Lower lake levels associated with extreme events linked to climate change, such as drought, result in decreased opportunities for lake recreation. The BKMC NGs manage six developed recreation sites (including the lake complexes described above); all of them feature camping and picnicking except the Cheyenne Nature Walk which is an interpretive trail. On the KRB NGs, picnic facilities have been developed at Thompson Grove and Felt. Camping and picnic facilities have been developed within Mills Canyon and on the rim. The Kiowa NG also has two interpretive sites—Mills Orchard Ranch and the Santa Fe Trail. See appendix H, "Recreation Suitability," for the complete inventory of recreation facilities on the Grasslands.

All developed recreation sites are open year-round. Drinking water is provided at all campgrounds except Mills Canyon and Rim Campgrounds, and is monitored for public safety standards. Reconstruction upgrades have partially occurred at all of the sites, with toilets and other facilities brought up to meet current Architectural Barriers Act accessibility guidelines. Visitor use of developed sites does not typically exceed 70 percent of capacity annually.

Recreational programs currently managed by the Grasslands generate revenue. Recreational annual revenue (based on a 3-year average 2005 to 2007) is $18,000[15]. Costs, based on a 3-year average of the program budget were $242,250.

## Environmental Consequences

*Common to All Alternatives.* Motorized dispersed camping would be affected in Mills Canyon as a result of the 2012 travel management decision. Dispersed camping by nonmotorized means would not be affected.

Economic efficiency based on revenues and costs was analyzed to estimate the present net value (PNV) for recreation, livestock grazing, minerals, and nonrecreation special uses by alternative. The PNV for alternative A is $152,409,146. The PNV for alternatives B and C is $151,130,674. The PNV difference between alternatives would be economically insignificant.

All alternatives would disallow surface occupancy for oil and gas leases in Mills Canyon of the Canadian River. This would preserve the unique recreation features of the canyon.

Extreme weather events associated with climate change such as drought would reduce water levels in lakes and result in fewer recreational opportunities. Similarly, campfires associated with

[14] Developed recreation sites may include facilities such as restrooms, picnic tables, grills, trash containers, parking barriers, and bulletin boards. Sites range in development levels from those with limited amenities to highly developed facilities.

[15] Recreation revenues were negatively impacted during this period as Lake McClellan, the only recreation fee area on the Grasslands, was burned over by wildfire and closed. Revenue is the total income received from an activitiy and can be more or less than costs.

dispersed camping would not be allowed under fire restrictions imposed during drought, consequently shifting use to developed sites.

*Alternative A.* ROS settings for the entire Grasslands would be limited to two classes: roaded natural or semiprimitive motorized. As a result, they would not accurately reflect the outdoor setting or how the public experiences recreation on the Grasslands. Opportunities to experience remoteness, naturalness, and solitude are higher than these ROS settings would suggest. There would be no change in the recreation opportunities.

No Grasslands-specific direction on dispersed recreation would be provided. This would have little consequence to dispersed recreation activities such as hunting, fishing, and camping. These activities would remain at current levels.

Developed recreation facilities would increase as new construction, increased capacity, and reconstruction of existing sites on the recreation complexes at Lake Marvin, Lake McClellan, and unspecified areas on the KRB NGs would be prescribed. The outcome would be recreation developments that far exceed demand.

*Alternatives B and C.* Alternatives B and C would include four ROS classes in the inventory: rural, roaded natural, semiprimitive motorized, and semiprimitive nonmotorized. The inclusion of two new classes, semiprimitive nonmotorized (SPNM) and rural (R) would provide more latitude for recreation planning. This would result in no change in the recreation opportunities provided to the public.

On the KRB NGs, 1,409 acres would be reclassified from roaded natural to rural near areas developed for commercial or industrial uses. This would reduce the area available for developed recreation, but would help preserve public safety.

In Mills Canyon and along the Canadian River and Santa Fe National Historic Trail, 8,139 acres would be reclassified from roaded natural and semiprimitive motorized to semiprimitive nonmotorized. This would reduce the area for motorized recreation opportunities, but would protect these natural and cultural features.

Guidelines would be provided to restrict dispersed camping within 200 feet of historic sites, trailheads (except those trailheads with designated dispersed sites already in use), stock water, and interpretive sites. This would result in protections for these recreation/cultural resources; however, there would be less area available for dispersed camping outside of the designated dispersed sites such as those on the BK NG.

Guidelines would be provided for construction and reconstruction of developed and dispersed recreation (trails) but would not prescribe specific projects. Management approaches would encourage evaluation of use trends when updating dispersed and developed sites. This would result in recreation developments that are responsive to visitor demand and expectations.

*Alternative C.* The consequences of alternative C would be the same as alternative B except for the following:

- Hunting and big game retrieval would be nonmotorized in the Canadian River PWA. This would result in an inconvenience for individuals who are mobility impaired.

- Nonmotorized recreation use would increase. Motorized use in the Canadian River PWA would cease. No decrease in visitation would be expected, but back-country users would eventually replace motorized users.

### Cumulative Environmental Consequences

The cumulative environmental consequences analysis area includes the communities near the Grasslands. We searched for recreation programs or developments in and around the Grasslands that would contribute to cumulative consequences and found none.

## Nature-Based Tourism

Section 1502.2(b) of the National Environmental Policy Act provides for discussion of impacts in proportion to their significance. The environmental consequences in this section focus on the components of nature-based tourism that are useful to the decision maker and the public. Additional information is in the "Special Areas and Nature-based Tourism Specialist Report" (USDA Forest Service 2011h).

### Affected Environment

The Grasslands are located in northeastern New Mexico and the panhandles of Texas and Oklahoma. This region of the country is predominantly rural, and there are a number of unique, nature-based recreational opportunities available.

Cooperative programs with state and Federal agencies and nongovernmental organizations (NGOs) are currently in place to facilitate the conservation of natural and cultural resources and to promote nature-based tourism. Bird and wildlife watching are developing into popular activities. A watchable wildlife viewing area is located in Mills Canyon and the National Audubon Society has recognized two important bird areas on the Kiowa NG—Perico and Sauz Creeks.

Ecotourism on the BK NG includes the Black Kettle Loop Trail, a segment of the Great Plains Trail of Oklahoma sponsored by the State of Oklahoma Department of Wildlife Conservation and other state agencies. Black Kettle Loop is an auto tour route that winds through the western Oklahoma panhandle including BK NG. Also within BK is Croton Creek Wildlife Viewing Area.

### Environmental Consequences

*Alternative A.* Direction would not be provided for managing nature-based tourism. This would result in opportunities missed to promote ecotourism and contribute to rural economic development. Tourism would increase as interest in birding and other natural or cultural features increases among the recreating public. However, this would be a natural increase and not a result of the plan.

*Alternatives B and C.* Management approaches would be provided to develop cooperative partnerships that provide protections for wildlife habitat. This would result in increased opportunities for bird watching, wildlife viewing, and access to the important bird areas. This would increase visibility and visitation and support rural economic development.

### Cumulative Environmental Consequences

We considered programs such as watchable wildlife, Black Kettle Loop Trail, and the important bird areas that would have positive benefits for rural economic development and wildlife/habitat conservation as key elements of nature-based tourism. This would result in increased jobs in conservation and service industries associated with tourism. Alternatives B and C would have positive cumulative consequences for nature-based tourism. Alternative A would not have any cumulative consequence to nature-based tourism. It would allow this activity, but would not emphasize partnerships or programs.

## Heritage Resources

Section 1502.2(b) of the National Environmental Policy Act provides for discussion of impacts in proportion to their significance. The environmental consequences in this section focus on the components of the heritage resource that are useful to the decision maker and the public. Additional information is in the "Heritage Resources Specialist Report" (USDA Forest Service 2011i).

### Affected Environment

Surveys of heritage resources have been extremely limited on the KRB NGs. Most surveys have been for range improvements, fence lines, utility corridors, and small wildlife projects. These are typically less than 10 acres and are often linear. Some block surveys with substantial acreage have been conducted for fuels projects. Surveyed acres on the KRB total 15,087. This represents only 6 percent of the total KRB NGs acreage. Two hundred and twenty-seven heritage resources have been documented on the KRB. The majority of recorded sites are Anglo-European in nature, consisting of ranching and farming homestead features and artifacts. The other site type consists of prehistoric and historic Native American artifact scatters.

The area around the KRB has small and widely distributed rural populations and lacks a presence of commercial development infrastructure (wind farms, oil and gas wells, cell phone towers, etc.). The majority of the ground-disturbing undertakings on the KRB are for grazing infrastructure such as wells, stock tanks, water lines, and fences. Damage done to Native American heritage resources largely came about in the historic era through farming, ranching, collecting of artifacts, and the environmental degradation of the Dust Bowl. The homestead sites range in condition from foundations only to standing walls with a large number of artifacts.

Five heritage resources have been designated as priority heritage assets and as such receive frequent monitoring for changes in condition and need for maintenance. These sites include two homestead complexes and three prehistoric rock shelters. Many preservation and interpretation opportunities still exist on the KRB NGs.

On the BKMC NGs, there has been much more survey—18,900 acres, or 57 percent of the total. Four hundred and thirty sites have been recorded. The most numerous recorded site type on these lands is the Native American lithic scatter, with historic remains a distant second.

Areas around the BKMC NGs have higher and denser population levels and more development infrastructure such as natural gas wells and pipelines. Heritage resources were historically damaged by farming and ranching activities, as well as by environmental circumstances. The

homestead sites have much less integrity than those on the KRB, with few retaining standing walls.

Currently there is one priority heritage asset on the BKMC, a prehistoric Native American site. The visitor's interpretive trail located adjacent to the district office holds the best opportunity for a heritage resources project on the BKMC.

### Environmental Consequences

*Common to All Alternatives.* Law, regulation, and policy would mandate Agency compliance of heritage resource protection, as well as accomplish goals that enhance the overall stewardship standards of the program, add to the public's enjoyment and education, and promote the economic potential of the surrounding communities. Due to law, regulation, and policy, any consequences of any alternative would be mitigated.

### Cumulative Environmental Consequences

There would be no cumulative environmental consequences to heritage resources from off the Grasslands and no difference in cumulative consequences among alternatives.

## Special Areas/Areas of Interest

Section 1502.2(b) of the National Environmental Policy Act provides for discussion of impacts in proportion to their significance. The environmental consequences in this section focus on the components of special areas and areas of interest that are useful to the decision maker and the public. Additional information is in the "Special Areas and Nature-based Tourism Specialist Report" (USDA Forest Service 2011h). For approximate location, see the "Special Areas and Eligible Scenic River Map" in appendix L.

### Affected Environment

Motorized activity on the entire KRB MA in which the following special areas and areas of interest are located will be governed by a 2012 travel management decision.

*Canadian Eligible Scenic River.* The Canadian Eligible Scenic River is an approximately 20 mile, free-flowing segment within Mills Canyon on the Kiowa NG with 17 miles on Forest Service lands and about 3 miles on other ownership. The outstanding and remarkable qualities associated with this eligible scenic river are its unique historic, scenic, geologic, and recreation features. For further information, see appendix C.

There has been uncontrolled motorized use and infestations of invasive plants (saltcedar) along the river. Human activity, including the use of various types of motorized vehicles, is evident throughout the canyon. User-created roads and trails exist along the river and cross the river. Vehicle tracks across meadows and up steep slopes further detract from natural ecosystem integrity and appearance (USDA Forest Service 2008c).

The dominance of invasive plants within the Canadian River corridor detracts from the scenic quality, water quality, wildlife habitat, naturalness, and other values of this area, although recent treatments for invasive species have resulted in a decline of saltcedar.

*Santa Fe Trail National Scenic Byway and La Frontera Del Llano Scenic Byway.* These are scenic highway corridors that pass through the Kiowa NG. The Santa Fe Trail National Scenic Byway runs in an east-west direction through Clayton, then north past Rabbit Ear Mesa toward the Colorado state line. La Frontera Del Llano Scenic Byway passes north-south through the Mills units between the towns of Abbott and Mosquero. The Grasslands play an important role in contributing to the scenic quality along the corridors and providing public open space uses such as picnic areas and interpretive sites. Currently, there are no uses on the Kiowa NG that conflict with the scenic resources along the byway corridors, and that trend is likely to continue. Visitation in these areas is projected to follow the national trend and increase as the nationwide interest in historical and cultural tourism increases (SESR).

*Santa Fe National Historic Trail.* The Santa Fe National Historic Trail is a national historic landmark. A 2.4-mile segment of the trail is located on the Kiowa NG and is in a high scenic integrity area. In 2001, the Forest Service developed an interpretive kiosk and day use/picnic site near the historic trail route in accordance with the (USDI) "Santa Fe National Historic Trail Comprehensive Management and Use Plan." The historic landmark site provides interpretive and recreational opportunities to a wide variety of visitors and contributes to local tourism. The Grasslands segment is especially important since most of the trail is located on private land and not accessible to visitors. The primary conflict to maintaining the historic and scenic qualities of the trail area is the unregulated motorized use that occurs there (USDA Forest Service 2008b). There is potential for wind energy development on both Forest Service and adjacent lands. The Forest Service would not have authority to control energy developments on adjacent lands.

*Research Natural Areas (RNAs).* There are no designated RNAs on the Grasslands. Shortgrass prairie and mixed-grass prairie were identified in the 1985 land management plan for study as possible RNAs on the Grasslands. A third vegetation type—sand sagebrush—was also found to be of interest. None were ultimately designated; however, many (about 20) ongoing research projects are being or have been conducted.

The 2009 RNA assessment[16] for the Grasslands evaluated each vegetation type according to Southwestern Region evaluative criteria. RNA needs were ranked on a scale of 1–3. A rank of 1 reflects the least need, the vegetation type is well represented. A rank of 2 indicates that the vegetation type is moderately represented, but more representation may be warranted. A rank of 3 reflects little or no representation of a particular vegetation type. In this assessment, ranks of 2 and 3 are considered appropriate for RNA recommendation. The vegetation types considered were:

#### Black Kettle and McClellan Creek NG

- Shinnery oak, ranked as 3, very underrepresented landscape wide
- Mixed-grass prairie, ranked as 3, very underrepresented landscape wide

[16] The objective of this effort was to support an effective ecological distribution of RNAs across major climate gradiants, biophysical settings, and across important vegetation types within life zones.

#### Kiowa and Rita Blanca NG

- Cottonwood-willow riparian, ranked as 3, very underrepresented landscape wide
- Shortgrass prairie, ranked as 2 underrepresented landscape wide
- Sand sagebrush, ranked as 3, very underrepresented landscape wide
- Pinyon-juniper, ranked as 2, underrepresented landscape wide

None of these vegetation types were recommended as a research natural area. All areas have been substantially modified by previous, unmanaged livestock grazing, irrigation, cultivation, road building, invasive species encroachment, herbicide use, fire suppression, and/or cumulative effects from off-Grasslands ownerships. For more information, see appendix D, which describes the evaluation process and conclusions for each vegetation type considered.

### Environmental Consequences

#### Canadian Eligible Scenic River

*Common to All Alternatives.* Implementation of the 2012 travel management decision would eliminate off-road use in Mills Canyon. The consequence would be reduced impacts from user-created roads and trails.

All alternatives would preserve the Canadian River's scenic river potential, and would recommend acquisition of lands within the canyon as they become available. The consequence would be preservation of the outstanding and remarkable qualities of the river.

#### Scenic Byways and National Historic Trail

*Common to All Alternatives.* Implementation of the 2012 travel management decision on the KRB would minimize the impacts on scenery and heritage resources by prohibiting cross-country use and unauthorized road development.

Standards for oil and gas leasing would prohibit surface occupancy within the boundaries of heritage resource sites that are listed or eligible for inclusion on the National Register of Historic Places. Additionally, no surface occupancy would be allowed in any developed recreational facility or interpretive site. The consequence would be minimal impacts to heritage and recreation sites.

*Alternative A.* Direction and guidance for the scenic byways and national historic trail would not be provided. However, these features would be managed to standards based on law, regulations, and policy that recognize and preserve selected roads based upon one or more archaeological, cultural, historic, natural, recreational, and scenic qualities. It would also provide protections for the national historic landmark (Santa Fe National Historic Trail).

*Alternatives B and C.* Design requirements would restrict wind energy developments to 500 feet outside of sites that are listed or eligible for inclusion on the National Register of Historic Places to minimize impacts to the Santa Fe National Historic Trail.

All unauthorized routes where resource damage is occurring in the area surrounding the Santa Fe National Historic Trail would be rehabilitated. The outcome would be a nonmotorized corridor

that promotes conservation of the historic features and setting of the trail. Ruts and other historic evidence would be protected from human impacts.

#### Research Natural Areas

*Alternative A.* Grasslands management would be directed to evaluate a specific species of vegetation (ecosystem) on each ranger district for possible recommendation and designation as an RNA. None of these areas qualify as RNAs; there would be no effect on RNAs.

*Alternatives B and C.* Evaluation, recommendation, or designation of specific ecosystems as RNAs would not be proposed; however, Forest Service Southwestern Region guidance directs that all vegetation types be evaluated for recommendation. All were evaluated and none met the criteria for recommendation. No consequence to research opportunities is anticipated, as research opportunities have been or are ongoing.

### Cumulative Environmental Consequences

The cumulative environmental consequences analysis area is the land immediately adjacent to these special areas of the Grasslands. The cumulative environmental consequences do not differ by alternative.

The Forest Service is currently working under a memorandum of understanding (MOU) with the National Park Service to manage our segment of the Santa Fe National Historic Trail. The Park Service has developed a strategic plan for the future that includes interpretation, education, and a marketing strategy to promote the trail locally, regionally, and nationally (Santa Fe National Historic Trail, Final Strategic Plan, 2003). The result will be consistency in signage and appearance of the trail and associated features.

Both the Santa Fe Trail and the scenic byways could be visually impacted due to large wind developments on lands adjacent to the Grasslands.

## Wilderness

Section 1502.2(b) of the National Environmental Policy Act provides for discussion of impacts in proportion to their significance. The environmental consequences in this section focus on the components of wilderness that are useful to the decision maker and the public. Additional information can be found in the “Kiowa National Grassland Wilderness Evaluation Report” (see the Web address provided in appendix B).

### Affected Environment

The Canadian River PWA was evaluated to determine how it might fit into the National Wilderness Preservation System, which includes all of the wilderness areas in the United States. The PWA was evaluated for capability, availability, and need. Capability includes five sets of factors that consider how the current conditions fit the definition of wilderness. Availability examines the potential impact of designating an area as wilderness to future land uses and activities; it is a summary of the tradeoffs between wilderness and other uses. The criteria used to evaluate need consider other wilderness and nonwilderness areas that provide opportunities for unconfined outdoor recreation, or the preservation of certain ecosystem characteristics. The PWA was rated medium for wilderness capability, medium for availability, and low for need.

Assumptions and methodology for this evaluation are summarized in the "Kiowa National Grassland Wilderness Evaluation Report" (see the Web address provided in appendix B).

*Size, Topography, and Location.* The Canadian River PWA is 6,028 acres, of which 5,444 acres are national grasslands and 584 are State Trust lands[17]. It is located in northeast New Mexico on the Canadian River about 55 river miles above Conchas Reservoir. The area is defined geographically by Mills Canyon with elevations ranging from 6,100 feet at the river to 6,800 feet at the canyon rim. A 150-foot wide corridor on either side of K600, K601, and K603 system roads, and a short dirt road numbered U MIL011 is excluded from the Potential Wilderness Area.

The boundary of the PWA would include a substantial portion of the Canadian River IRA. We interpret the map in the "Forest Service Roadless Area Conservation FEIS," 2000, as excluding roads K600 to the river, K601to the developed campsites, and K603 to the ruins parking lot, and a short dirt road numbered U MIL011 that provides access to the dispersed site known as the "Rock Table" from the IRA boundary. There is considerable boundary coincident with private land on the west side of the potential wilderness, which is frequently used to access Mills Canyon.

Nearby population centers include Las Vegas, New Mexico, to the southwest and Raton, New Mexico, to the northwest. The PWA is located approximately 40 miles east of Interstate 25.

*Vegetation.* Along the canyon bottom, within the river flood plain, vegetation is dominated by invasive saltcedar, although some cottonwood and willow remains. Much work has been done to reverse this trend. The dominant vegetation on canyon slopes varies depending on aspect, with pinyon pine, juniper, and Gambel oak the principal tree species. The vegetation on cooler, moister side drainages and the edge of the canyon rim is generally comprised of ponderosa pine stringers.

*Surroundings and Land Ownerships.* The vegetation above the canyon rim is characterized by shortgrass and mixed-grass prairie on rolling hills. The non-Forest Service lands adjacent to the PWA boundary are parcels of private ranchlands and lands managed by the State of New Mexico and the Bureau of Land Management (BLM).There are 584 acres of State land inside the PWA boundary[18].

*Current Uses and Appearance.* The potential wilderness area is dominated by canyon terrain. Recreational use levels are light to moderate with motor vehicle use, horseback riding, and fishing and hiking the most common summer activities. This area does not have any motorized trails and only a short hiking trail at the ruins of the Mills Ranch house. Most of the horseback

[17] Differences between documents in reported acreages are a result of a recalculation using GIS. The recalculation eliminated from the NFS land total, the 60 meter corridor surrounding the 600 Road.

[18] The Cibola NF and NGs acknowledge that the potential wilderness as described and configured in alternative C includes approx. 584 acres of New Mexico State Land Office (SLO) land. This alternative does not commit the SLO to the exchange or sale of that parcel to the U.S. Forest Service. If the Forest Service responsible official selects alternative C as the preferred Grasslands plan, consultation with the SLO as to willingness to exchange or sell said land would be further pursued during the interim between the draft and final environmental impact statements. If the SLO does not wish to exchange or sell the land in question, the boundaries of the potential wilderness would be adjusted and the wilderness reduced in size. Similarly, recommendation of wilderness would not affect the management of adjacent State land. If the area were to be designated by Congress as wilderness, it would not prevent any activity or development from taking place on adjacent State or private land. Non-Federal lands surrounded by wilderness are ensured adequate access to their property in accordance with FSM 2326.13. Non-Federal lands that have access available from outside the wilderness will not be entitled access to their properties through a wilderness area.

riding occurs on the roads or unauthorized routes off K 600. This reach of the Canadian River is predominately a warm water fishery that receives light to moderate fishing activity. At this time there are no special use permits authorizing recreation use for activities such as guided tours or big game hunting. This portion of the Grasslands is a very popular deer hunting area, which results in increased use of the dispersed camping sites in the canyon. Between the rim and the canyon bottom, there are two small 2-track roads that access camping spots in mid-canyon. It is open year round unless snow closes the road in winter. The Canadian River PWA and surrounding areas appear mostly natural other than the occurrence of user-created 2-track roads, invasive plants growing along the river, historic adobe structures located in the canyon, developed campground facilities, fences, dirt tanks, vehicle barriers, signs, hardened low water crossings, forest development roads, and bridges. The PWA contains, or partially contains, three grazing allotments which are stocked with cattle.

### Environmental Consequences

*Common to All Alternatives.* Restriction of motorized access into the potential wilderness would present a substantial enforcement issue where the potential wilderness is bounded by private lands on the west. If the proposed action under consideration in the pending KRB travel environmental assessment is selected, the motor vehicle use map for the Kiowa NG would prohibit motorized travel within the area under alternative A. A change in ROS classification from semiprimitive motorized to semiprimitive nonmotorized as proposed by alternative B would prohibit public motorized activity in the area, under that alternative. Finally, wilderness designation would prohibit motorized access under alternative C.

*Alternative A.* This alternative does not recommend wilderness. This alternative would manage the canyon to preserve its wild, scenic, or recreation river potential. It would preserve the unique qualities of the river.

Motorized trails would be allowed for recreation (unless decided otherwise by a travel management decision), reducing the self-reliant experience and solitude common to wilderness.

Management direction for the area would promote and demonstrate grassland agriculture.

*Alternative B.* This alternative does not recommend wilderness. The Mills Canyon MA would be managed as an unroaded back-country area. Protection of the outstanding and remarkable features of the eligible scenic river segment would be maintained.

The effect of not designating wilderness would be a variety of uncrowded, motorized and nonmotorized recreation opportunities in a natural or natural appearing setting. Future recreation developments and trails would be designed to maintain integrity of the natural setting.

Saltcedar control treatments and prescribed fire activities using motorized or mechanical equipment would be allowed and improve the functioning of natural systems within the canyon.

Some wilderness characteristics may be compromised by structures that may be needed to reduce the impacts of recreation uses on the riparian habitat.

Livestock grazing and recreation activities would have minimal conflict. Grazing would be used strategically to manage fuels and support healthy vegetation management.

*Alternative C.* This alternative would recommend wilderness designation on 6,028 acres. The Canadian River PWA would be managed to protect its wilderness characteristics. Protection of the outstanding and remarkable features of the eligible scenic river segment would be maintained. The area would be managed to promote an open, natural, or natural appearing landscape.

Motorized recreation would be terminated and nonmotorized recreation would dominate the area. Use of motorized equipment or mechanized transport would not be allowed except when addressing the need for essential activities that cannot be met by primitive means. While a decrease in visitation would not be expected, motorized users would likely be replaced by those seeking a back-country experience. The economic effects of substituting one type of recreation user for another would have unclear impacts on tourism.

Future saltcedar control treatments would not be prohibited, but would be executed without motorized or mechanized equipment. Natural processes would be the dominant influence upon vegetation composition and structure, as management influence would be limited.

FSM 2320 would be the source of direction for wildfire suppression strategy and prescribed fire. Managing fire in wilderness would be different than for fire occurring in other areas. Prescribed fire would be limited to restoration projects that mimic natural fire regime or reduce unacceptable fuel loads.

Unobligated grazing allotments, at the time of designation, would not be permitted for use in the future.

#### Cumulative Consequences

There are no known or anticipated cumulative effects upon the Canadian River PWA.

# Needs for Change
# Topic 3: Human Influences

## Roads and Access

Section 1502.2(b) of the National Environmental Policy Act provides for discussion of impacts in proportion to their significance. The environmental consequences in this section focus on the components of roads and access that are useful to the decision maker and the public. Additional information is in the “Roads and Access Specialist Report” (USDA Forest Service 2011j).

### Affected Environment

The KRB NGs have about 492 miles of NFS roads (herein referred to as “system roads”), while the BKMC NGs contain about 118 miles of system roads (USDA Forest Service 2011g). The majority of roads in Grassland units are native surface roads maintained for high-clearance vehicles. Roads within or leading to administrative sites or developed recreation sites are typically gravel-surfaced or paved roads maintained for passenger car traffic.

Because of the checkerboard pattern of ownership within the Grasslands administrative boundaries, many portions of Grassland units are accessed only by roads passing through private property for which there are no legal public rights-of-way. While many property owners allow passage through their property to access Federal lands, some do not.

There are more NFS roads than are needed for administration of the Grasslands. Road maintenance budgets have steadily declined over the last several years, and this trend is expected to continue in the foreseeable future.

In addition to the excess of existing NFS roads, there are many user-created roads as a result of unmanaged motor vehicle use. User-created roads are not maintained, and many are either causing environmental damage or are likely to cause damage at some point in the future if not addressed. The issue of user-created roads is more of a concern on the KRB NGs, where off-road vehicle use is allowed, than it is on the BKMC NGs, where off-road vehicle use has been prohibited for some time.

To comply with the 2005 Travel Management Rule, the Forest Service is in the process of designating NFS roads and trails for motor vehicle use. This travel management process has been completed for the BKMC NGs, and a motor vehicle use map (MVUM) displaying the designated roads and trails has been published. The travel management process for the KRB NGs is scheduled to be completed prior to the transition to the new Grasslands plan.

### Environmental Consequences

*Common to All Alternatives.* Roads and access would be subject to the decisions of the KRB and BKMC travel management decisions. The lack of legal access to NFS lands would be identified as a management concern and direct that rights-of-way would be obtained to address this concern. Increased access would facilitate Grasslands management and improve the ability to provide goods and services in a variety of resource areas. Regulation and policy govern decommissioning of NFS and user-created roads and methods of decommissioning, which consist of physical treatments to restore the road to a more natural state.

*Alternatives B and C.* Unneeded roads (both NFS roads and user-created roads) would be decommissioned and methods of decommissioning addressed. Travel would become more centralized on remaining roads, and other resources would be less adversely affected by motor vehicles.

### Cumulative Environmental Consequences

Common to all alternatives, the non-NFS land inside the Grasslands administrative boundaries was selected as the cumulative effects analysis area. There would be no cumulative environmental consequences associated with legal access to or through Grasslands units, nor would there be any cumulative consequences to the decommissioning of unneeded roads or to the support of the travel management decision.

## Land Adjustment

Section 1502.2(b) of the National Environmental Policy Act provides for discussion of impacts in proportion to their significance. The environmental consequences in this section focus on the components of land adjustment that are useful to the decision maker and the public. Additional information is in the “Land Adjustment Specialist Report” (USDA Forest Service 2011k).

### Affected Environment

There have been recent land acquisitions through purchase of 386 acres in 2010 and one being processed for purchase in 2011 of 160 acres within the KRB NGs. Additionally, there was a land exchange (disposal) in 1992 of 14 acres within the BK NG.

Lands acquired from willing sellers have qualities that improve the Agency's ability to carry out its mission on the national grasslands. The location or condition of the parcel being acquired contributes to consolidation of the ownership pattern of the national grasslands, provides necessary road or trail access to NFS lands, has unique or high quality natural or cultural resources, improves the management or designated special areas, contains important plant or animal habitats, contains or influences wetlands or flood plains, or provides opportunities to rehabilitate or stabilize adjacent NFS lands.

Grasslands units available for exchange or disposal are generally isolated parcels and lack unique natural and cultural resources.

### Environmental Consequences

*Common to All Alternatives.* There would be positive environmental consequences to the Grasslands from land adjustment acquisition or exchange among all alternatives. All alternatives encourage acquisition of lands needed to improve management or meet specific administrative needs including rights-of-way. Disposal of less desirable property would be accomplished by sale or exchange.

### Cumulative Environmental Consequences

The non-NFS land inside the Grasslands administrative boundaries was selected as the cumulative effects analysis area. Land adjustment acquisition would result in no cumulative environmental consequences as it pertains to management direction by alternative.

## Minerals and Energy Development

Section 1502.2(b) of the National Environmental Policy Act provides for discussion of impacts in proportion to their significance. The environmental consequences in this section focus on the components of minerals and energy development that are useful to the decision maker and the public. Additional information is in the "Minerals and Energy Specialist Report" (USDA Forest Service 2011l).

### Affected Environment

Production of oil and gas products is vital to the national, regional, and local economies and to the quality of life of most Americans. In 2001, 36 active wells on the BK yielded roughly 3 billion cubic feet of natural gas and 13,500 barrels of oil. On the MC NG, 13 wells yielded about 5,900 barrels of oil.

Leases and royalties generate revenue from gas and oil. Annual revenue (based on a 3-year average, 2005 to 2007) is $13,468,000. Costs, based on a 3-year average of the program budget were $445,252.

Current mining practices often include disposal of drilling fluids and cuttings onsite.

Oil and gas operations on the BK make a significant contribution to the local economy, job market, and county and state tax structure. In 2001, oil and gas operations generated royalties that contributed nearly $400,000 annually to schools and roads in Roger Mills County and provided roughly 80 jobs in the local communities. In 2010, royalties soared to nearly $4 million.

The geologic potential for hard rock mining in the Grasslands appears to be limited. There is potential for mining mineral materials; however, mineral materials are not available for commercial or private use because of stipulations in the Bankhead-Jones Farm Tenant Act. The KRB NGs provide special use permits to public authorities and agencies under the condition that the mineral materials are used for public purposes. Two permits have been granted to county governments for extracting caliche, a subsoil deposit of calcium carbonate that is used to surface roads. There are currently two active caliche pits that encompass less than 4 acres each. The projected future trend is that there will continue to be an insignificant amount of noncommercial mineral material extraction from the Grasslands.

Some oil and gas leases and active wells do exist on the BKMC NGs in areas classified as having high or moderate scenic integrity; these are non-Federal wells on lands where mineral rights did not transfer to the Federal government when lands were purchased under the Bankhead-Jones Act.

Two oil and gas leases have recently been issued for the RB NG in units 89 and 91; the leases are in effect as of October 1, 2010.

### Environmental Consequences

*Common to All Alternatives.* Where not specifically directed, minerals and energy development would be conducted in accordance with law, regulation, and policy and through the use of BMPs. Such practices would result in rehabilitating defunct oil and gas drilling pads and associated roads. Additionally, surface occupancy would be prohibited in some areas to protect special values or uses. No open pits will be allowed, and a closed loop drilling system will be used for all oil and gas drilling.

Economic efficiency based on revenues and costs was analyzed to estimate the present net value (PNV) for recreation, livestock use, minerals and energy, and nonrecreation special uses by alternative. The PNV for alternative A is $152,409,146. The PNV for alternatives B and C is $151,130,674. The difference in PNV between alternatives would be economically insignificant.

*Alternatives B and C.* Implementing BMPs that benefit the environment may also increase production costs as:

- Soil and water contamination would be minimized because all drilling fluids and drill cuttings would be removed from the Grasslands.
- Common variety mineral extraction sites and drilling sites would be rehabilitated to specifications within 1 to 3 years after disturbance.
- As existing structures on mineral leases would meet visual objectives.

### Cumulative Environmental Consequences

Extraction activities on the Grasslands may increase as global and domestic energy prices rise.

## Special Forest Products

Section 1502.2(b) of the National Environmental Policy Act provides for discussion of impacts in proportion to their significance. The environmental consequences in this section focus on the components of special forest products that are useful to the decision maker and the public. Additional information is in the "Forest Products Specialist Report" (USDA Forest Service 2011m).

### Affected Environment

A small portion of the Grasslands contains pinyon pine and juniper (pinyon-juniper) woodlands on the western half of the Kiowa NG and mixed-hardwood woodlands encroaching on the BK NG. Over the past 60 to 80 years, dependence on wood products has declined as lifestyles shifted from subsistence to ranching. There is a relatively low demand by rural residents for posts, poles, and firewood, and for vigas and latillas that are occasionally used as home building materials.

The supply of firewood on the Grasslands is dependent on the amount of wood that has been thinned by Grassland employees or contractors. On the KRB, cut down trees are left at thinning sites for the public to remove. This is a cost-effective way to meet ecological objectives.

The Kiowa NG provides just over 100 cords per year for sale. Market value has been about $100 per cord, yielding revenues of about $10,000 per year. Demand is not expected to greatly increase, as the human population near the pinyon-juniper woodlands is low and declining.

Even though the supply of available wood on the Kiowa NG has fluctuated between 200 and 600 acres during the period from 1998 to 2005, it has been adequate to meet the demand for wood from this remote area. It is projected that the supply will continue to adequately meet firewood demand in this area as thinning is expected to continue in order to meet ecological objectives. Currently, about 500 to 900 acres of pinyon-juniper that are overstocked and encroaching onto the shortgrass prairie are thinned annually.

The BK NG has designated areas where the public may remove undesirable mixed hardwood trees for firewood. Although supply far outweighs demand, this activity helps to restore the native grassland ecosystem while providing a wood product. Average volume in mixed hardwood stands that are no longer needed as windbreaks or have escaped the original footprints of shelterbelts or windbreaks is about 941 cubic feet per acre (7.35 cords per acre). Some of the tree rows planted to Osage orange after the Dust Bowl have also been or are currently being harvested for posts.

Even though employment income associated with woodcutting activities is negligible, it provides a resource that is important to individuals who rely on the cheap availability of these products to subsist. The gathering of wood products has not shown to be in conflict with other uses on the Grasslands, and demand for this activity is not projected to increase or decrease significantly in the future.

### Environmental Consequences

*Common to All Alternatives.* Pinyon-juniper forest products would be available to the public.

*Alternatives B and C.* Invasive tree forest products would be available on 1,000 to 2,000 acres on the BK NG. Forest product availability would be limited in the pinyon-juniper vegetation type on the KRB NGs from April 15 to July 31.

*Alternative C.* Removal of some forest products could be prohibited in the potential wilderness area.

### Cumulative Environmental Consequences

There are no known cumulative environmental consequences regarding special forest products.

## Special Uses

Section 1502.2(b) of the National Environmental Policy Act provides for discussion of impacts in proportion to their significance. The environmental consequences in this section focus on the components of special uses that are useful to the decision maker and the public. Additional information is in the "Special Uses Specialist Report" (USDA Forest Service 2011n).

### Affected Environment

There are special use permits, easements, and leases which authorize services supporting the Grasslands' mission and meet the needs of the public. These permits are a partnership among the Agency, private businesses, and individuals to provide services and facilities which contribute to economic growth and sustainability. Over half of the special use permits on the BKMC NGs are related to oil and gas operations, and most permits on the KRB NGs are for power lines and road easements.

Special uses generate revenue for the Grasslands. From 2005 to 2007, the average annual revenue from special uses was $58, 000 and costs were $7,393.

Transmission corridors, pipelines, and wind energy facilities are being developed in the private sector and are expected to expand onto the Grasslands where not conflicting with air traffic, wildlife, heritage, and scenery concerns. Currently there is one existing natural gas/oil pipeline corridor crossing units of the BK NG, and the KRB NGs have a gas pipeline passing through Texas and New Mexico.

### Environmental Consequences

*Common to All Alternatives.* The local economy would benefit through the issuance of special use permits. Permits would be restricted or tailored to avoid conflict with air traffic, wildlife, heritage, and scenery concerns.

Economic efficiency based on revenues and costs was analyzed to estimate the present net value (PNV) for recreation, livestock grazing, minerals, and nonrecreation special uses by alternative. The PNV for alternative A is $152,409,146. The PNV for alternatives B and C is $151,130,674. The PNV between alternatives would be economically insignificant.

### Cumulative Environmental Consequences

Future energy development adjacent to the Grasslands may increase the likelihood of energy development on the Grasslands and the subsequent issuance of special use permits.

## Wind Energy Development

Section 1502.2(b) of the National Environmental Policy Act provides for discussion of impacts in proportion to their significance. The environmental consequences in this section focus on the components of wind energy development that are useful to the decision maker and the public. Additional information is in the "Wind Energy Development Specialist Report" (USDA Forest Service 2011o).

### Affected Environment

Wind energy development is permitted by special use permits which authorize services that support the Forest Service mission and meet the needs of the public. Northeastern New Mexico and the Texas and Oklahoma panhandles have high potential for wind energy generation. Currently there is no wind energy development or high-power transmission lines on the Grasslands or adjacent private land, but wind turbines are planned to be installed on private land about ¼ mile from the BKMC NGs boundary. It is expected that demand for development of wind energy on the Grasslands is likely to occur and increase. The Grasslands, because of their location and fragmentation, will likely experience proposals for development as adjacent lands are developed. As the private lands are developed and reach a point of diminishing marginal return, it is likely industry will focus its efforts on public lands.

### Environmental Consequences

*Common to All Alternatives.* Where not specifically directed by the plan, installation of wind turbines and high-power transmission lines would be conducted in accordance with law, regulation, and FS wind energy development and siting directives published in 2011. Wind energy development would be authorized by the special use program requiring project-specific NEPA analysis, adding to costs and delaying project implementation. Wind energy development would economically benefit the local economy.

*Alternative A.* Without pre-siting guidance, all wind development project proposals would be subject to NEPA analysis wherein project-specific environmental consequences would be evaluated.

*Alternatives B and C.* Wind energy development would be restricted to within one-half mile of developed recreation sites. Wind energy development would also be restricted on a site-specific basis for wildlife and heritage concerns.

### Cumulative Environmental Consequences

The cumulative effects area includes the land with potential for wind energy development on or adjacent to the Grasslands. Wind energy facilities on private lands could increase the likelihood of construction of transmission corridors and access routes on the Grasslands.

## Livestock Use

Section 1502.2(b) of the National Environmental Policy Act provides for discussion of impacts in proportion to their significance. The environmental consequences in this section focus on the components of livestock use that are useful to the decision maker and the public. Additional

information is in the "Livestock Use and Range Management Specialist Report" (USDA Forest Service 2011p).

### Affected Environment

Over 99 percent of the KRB and BKMC NGs is used by permit holders to graze cattle. The Grasslands administer permits for 180 permittees on 416 grazing units. Vegetative conditions are able to support 91,406 AUMs[19] of livestock grazing and provide for wildlife habitat and watershed protection. The number of AUMs permitted fluctuates based upon climatic conditions. The drier vegetation types west of the 100th meridian are more acutely influenced by drought. Carrying capacity may be affected by BTPDs (a Forest sensitive species) which occupied about 3,800 acres in 2011. Cattle are not allowed near playa lakes when migratory birds are present so as to comply with the Migratory Bird Treaty Act (MBTA) of 1918, which protects migratory birds and their nests and eggs. Additionally, although no wind turbines are present on the Grasslands, future forage production may be reduced in proportion to the number of wind turbines installed and their access roads.

The livestock grazing program managed by the Grasslands generates revenue. From 2008 to 2010, the average annual revenue from livestock use was $165,042 and costs (based on a 3-year average of the program budget) were $233,524.[20]

A major increase or decrease in grazing on the Grasslands over the next 20 years is not foreseen; however, livestock use and strategies are expected to continue to fluctuate in response to drought, wildfire, prescribed fire, and other factors that influence range conditions.

### Environmental Consequences

*Common to All Alternatives.* Where not specifically directed by the plan, livestock use would be conducted in accordance with law, regulation, policy, applicable NEPA decisions, and through the use of BMPs and adaptive management to maintain a sustainable grazing resource.

Drought would reduce available forage and livestock industry income. BTPDs may reduce available forage. Forage would not be available to cattle near playa lakes during the migratory bird breeding season. Except for the long-term loss of forage base on the small areal extent of wind turbine pads and access roads, it is anticipated that disturbance to livestock would be temporary, as livestock would become accustomed to their presence.

Economic efficiency was analyzed to estimate the present net value (PNV) for recreation, livestock use, minerals, and nonrecreation special uses by alternative. The PNV for alternative A is $152,409,146. The PNV for alternatives B and C is $151,130,674. The PNV between alternatives would be economically insignificant.

*Alternative A.* Available forage would increase as 4,400 acres of shinnery oak would be converted to grassland. Livestock use would be facilitated by the construction of 55.6 miles of fence, 64

[19] An animal unit month (AUM) is the amount of forage consumed in 1 month by 1 mature cow of about 1,000 pounds, either dry or with calf up to 6 months of age, or their equivalent.

[20] During this period the authorized herd was less than that which is typically permitted due to drought conditions. This resulted in slightly higher costs than revenues for the livestock grazing program.

watering facilities, and 3 miles of water pipeline on the BKMC NG and by 365 miles of fence, 514 watering facilities, and 21 miles of water pipeline on the KRB NGs.

*Alternatives B and C.* Forage quality would decrease in pastures containing playa lakes deferred from grazing between April 1 and August 31 when water is present and bird nesting is occurring.

### Cumulative Environmental Consequences

Currently, interest in irrigated crop farming has resulted in grassland conversion to crops on nearby private land. The conversion of native grasslands to cropland will likely continue into the future, depending on a host of economic circumstances.

The cumulative environmental consequences analysis area is the land immediately adjacent to the Grasslands. Expansion of prairie dog colonies onto the Grasslands resulting from the Oklahoma Department of Wildlife Conservation Landowner Incentive Program could reduce available livestock forage on the Grasslands.

## Wildland-Urban Interface and Fire Management

Section 1502.2(b) of the National Environmental Policy Act provides for discussion of impacts in proportion to their significance. The environmental consequences in this section focus on the components of WUI and fire management that are useful to the decision maker and the public. Additional information is in the "Wildland-Urban Interface/Fire Specialist Report" (USDA Forest Service 2011q).

### Affected Environment

Wildland fire includes both planned and unplanned ignitions. WUI includes those areas of resident populations at imminent risk from wildfire, and human developments having special significance. These areas may include critical communications sites, municipal watersheds, high voltage transmission lines, observatories, church camps, scout camps, research facilities, and other structures that if destroyed by fire, would result in hardship to communities. These areas encompass not only the sites themselves, but also the continuous slopes and fuels that lead directly to the sites, regardless of the distance involved.

Historically, natural disturbances were a regular occurrence on the Grasslands. Fire plays a key role in maintenance of the grassland system, and it is probably the most significant process in sustaining plains grassland ecosystems. Grassland fires release nutrients into the soil, which stimulates nutrient cycling and soil productivity. Grassland fires reduce the establishment of woody trees and shrubs, which helps maintain a more resilient grassland composition and structure. The encroachment of woody species that threatens plains grasslands in the region is not only the result of over 100 years of fire suppression, but also the planting of shelterbelts and other tree species during the early years of Grasslands restoration in the 1940s.

Research shows that the Grasslands had a fire occurrence on an average of 2 to 20-year intervals. Fire is used primarily to improve range conditions by reducing the shrub-to-grass ratio in areas where shrubs are gaining dominance. Planned ignitions in the wildland-urban interface proactively reduce the likelihood of wildland-fire-caused damage. Planned ignition is subject to several constraints, however, one of which is drought. Managers conduct little or no planned ignition during drought because it may increase soil erosion from wind and rain and allow

nonnative or invasive species to outcompete native grasses. Under nondrought conditions, residual ground cover and quick regrowth protect the soil surface, and adequate soil moisture keeps native grasses competitive. Efforts to increase awareness of fire behavior and effects have increased public support for planned ignition and the creation and maintenance of defensible space.

Currently, planned ignition is used in all management areas and vegetation types. Grasslands managers use planned ignition to eliminate the excess of woody trees and shrubs, including invasive trees like black locust and eastern redcedar. Planned ignition also improves the diversity of structural stages and restores fire-adapted ecosystems. Over the past 10 to 12 years, about 80 percent of the BKMC NGs have been burned, with some units burned 2 to 4 times, and about 2 percent of the KRB NGs units have been burned, mostly in the pinyon-juniper ecosystem.

Wildland fires burned about 7,300 acres on all four Grasslands between 1995 and 2005. The 2006 fire season was especially unique due to prolonged drought and burned over 3,700 acres of the BK NG, 1,500 acres of the MC NG (the entire BKMC NGs), and 850 acres of the KRB NGs.

### Environmental Consequences

*Alternative A.* Grassland resource objectives would be met and wildland-fire-caused damage would be reduced on an unspecified number of acres in Grassland WUI areas.

*Alternatives B and C.* Resource objectives would be met and wildland-fire-caused damage would be reduced on 2,000 to 3,000 acres annually in Grassland WUI areas.

### Cumulative Environmental Consequences

The Grasslands and adjacent private land (within about 1 mile) is the cumulative effects analysis area. Wildland-fire-caused damage would be reduced on the Grasslands as off-Grasslands fire severity decreases in response to the creation and maintenance of defensible space on private land adjacent to the Grasslands.

## Socioeconomic Resources

Section 1502.2(b) of the National Environmental Policy Act provides for discussion of impacts in proportion to their significance. The environmental consequences in this section focus on the components of the social and economic environments that are useful to the decision maker and the public. Additional information is in the Grasslands plan revision economic resource report (Wilson 2010).

### Affected Environment

The study area for this analysis is Harding, Mora, and Union Counties in New Mexico, Roger Mills and Cimarron Counties in Oklahoma, and Dallam, Gray, and Hemphill Counties in Texas. A portion of Colfax County, New Mexico, is also within the planning area, but is only four sections of rangeland on the Kiowa NG. It was eliminated from the socioeconomic analysis because the county's relatively large population would skew the demographic and economic data based upon those four sections of range. This region of the country is predominantly rural and has an economic base consisting largely of agricultural industries. The Forest Service manages four

revenue-generating goods and services on the Grasslands: gas and oil extraction (minerals), livestock grazing, recreation, and nonrecreation special uses as described below.

Table 28 reports the percent of each county under Grasslands management by district. Dallam County, Texas, has the largest percent of land base under Grasslands management at 8 percent. Hemphill County, Texas, has the smallest, at less than 0.1 percent.

The oil and gas resource is an important economic activity for the region. In 2001, there were 36 active oil/gas wells on the BKMC NGs and none on the KRB NGs (USDA Forest Service 2008). Geologic analyses recently completed indicate that while there may be increases in the number of oil/gas wells on the BK for a few more years, oil/gas development in the area may decline over the next 20 to 50 years as wells lose productivity. There has historically been little interest in oil and gas exploration on the KRB NGs because of difficulty and costs of extraction. However, with rising energy prices, there has been increased interest from energy developers and an increase in applications for permits to drill.

**Table 28. Percent of county under Grasslands management**

| Forest Service Ranger District | County, State | Percent of County within Grasslands | Total Square Miles by County, 2000 |
|---|---|---|---|
| KRB | Harding County, NM | 5% | 2,125 |
| KRB | Union County, NM | 2% | 3,830 |
| KRB | Mora County, NM | < 0.5% | 1,931 |
| BKMC | Roger Mills County, OK | 4% | 1,141 |
| KRB | Cimarron County, OK | 1% | 1,835 |
| KRB | Dallam County, TX | 8% | 1,505 |
| BKMC | Gray County, TX | < 0.2% | 928 |
| BKMC | Hemphill County, TX | < 0.1% | 910 |

Source: UNM-BBER 2005 (U.S. Census Bureau, Decennial Census 2000).

Over 99 percent of the Grasslands are used by permit holders for livestock grazing. There is no indication that there will be a major increase or decrease in grazing on the Grasslands over the next 20 years; however, herd size and management strategies are expected to fluctuate in response to drought, wildfire, prescribed fire, and other factors that change range conditions. Grazing on the Grasslands contributes to the rural ranching lifestyle, culture, and economy and is a tool used for achieving management objectives.

Providing outdoor recreation activities is one of the primary contributors to social cohesion, quality of life, and social and economic sustainability for Grasslands communities. The most popular recreation activities on the Grasslands include hunting, fishing, camping and picnicking, boating, hiking, horseback riding, exploring historic sites, and driving to enjoy the scenery. The BKMC NGs manage six developed recreation sites, including two recreation complexes designed around scenic reservoirs; the KRB NGs manage five. All sites are open year round.

Special use permits authorize services that support the Forest Service mission and meet the needs of the public. These permits are a partnership between the Forest Service and private businesses and individuals to provide services and facilities, such as recreation opportunities and infrastructure. In particular, the construction and use of utilities supporting rural residences and industry are part of the Grasslands contribution to economic growth and sustainability. Over half of the special use permits on the BKMC NGs are related to oil and gas operations, and most permits on the KRB NGs are for power lines and road easements. There are also many research projects on the Grasslands, conducted by universities and other research institutes, which are authorized by special use permit. It is projected that development of oil and gas and wind energy in the region may result in more requests for utility and pipeline special use permits.

### Demographic Conditions and Trends

Current population levels influence the use of natural resources, and forecasts of future population levels can indicate whether there may be the potential for increased pressures on Grasslands resources.

Table 29 shows the past, present, and projected population trends for each county in the study area and the aggregated states. From 1980 to 2010, the population of Grassland counties declined 10 percent, from 56,688 to 50,877, while the combined state populations increased by 62 percent, from 18,557,375 to 30,150,629. This decline in the local population is due in part to limited economic opportunities and low income levels. This is a common trend among rural areas across the country, and can greatly increase the importance of the economic contribution of Grasslands revenue-generating programs and their management. The declining trend in population is expected to continue for all counties except Dallam and Mora. But growth in those counties is expected to be concentrated in urban areas outside the vicinity of the Grasslands.

**Table 29. Population trends for Grassland counties and aggregated states**

| County | 1980 | 1990 | 2000 | 2010 | 2020 | 2030 |
|---|---|---|---|---|---|---|
| Harding County, NM | 1,090 | 987 | 810 | 780 | 726 | 676 |
| Mora County, NM | 4,205 | 4,264 | 5,205 | 6,205 | 7,137 | 7,826 |
| Union County, NM | 4,725 | 4,124 | 4,174 | 4,365 | 4,507 | 4,619 |
| Cimarron County, OK | 3,648 | 3,301 | 3,148 | 3,200 | 3,400 | 3,500 |
| Roger Mills County, OK | 4,799 | 4,147 | 3,436 | 3,400 | 3,400 | 3,400 |
| Dallam County, TX | 6,531 | 5,461 | 6,222 | 6,930 | 7,537 | 7,949 |
| Gray County, TX | 26,386 | 23,967 | 22,744 | 22,434 | 22,365 | 21,859 |
| Hemphill County, TX | 5,304 | 3,720 | 3,351 | 3,563 | 3,659 | 3,548 |
| Study Area Total | 56,688 | 49,971 | 49,090 | 50,877 | 52,731 | 53,377 |
| NM, OK and TX | 18,557,375 | 21,647,164 | 26,121,520 | 30,150,629 | 34,352,708 | 38,648,53 |

Source: UNM-BBER 2005.

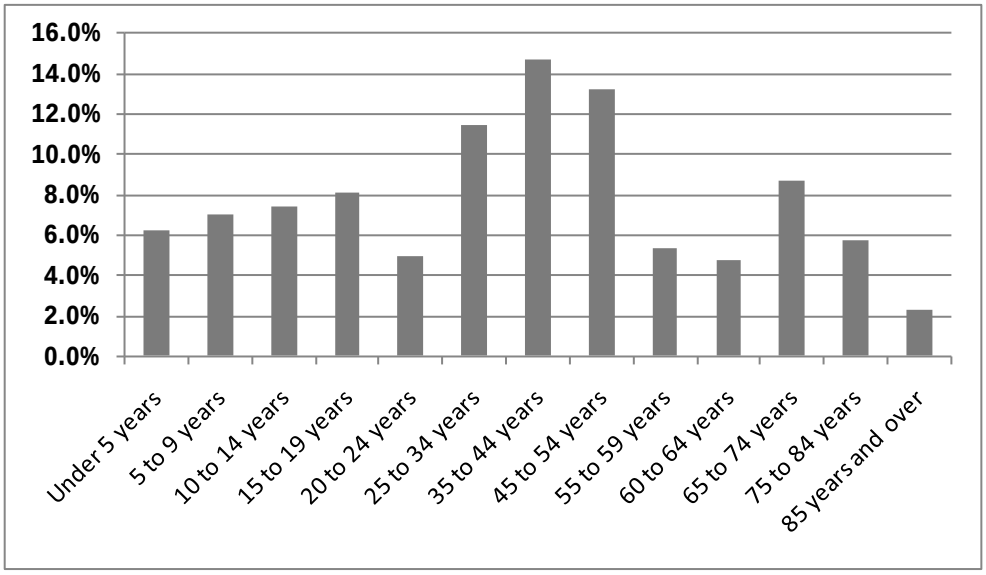


**Figure 2. Age distribution in the study area**

Table 30 reports the ethnic composition of the study area. According to census definitions, Hispanic or Latino may be of any race. As defined by the U.S. Census Bureau, race and Hispanic origin are two different concepts; thus, people of Hispanic origin may identify with any race, therefore, the percentages do not sum to 100 percent. The majority of the population in the study area is Caucasian; there is also a substantial proportion of the population that is of Hispanic origin. Mora County is the most diverse with 58.9 percent of residents being Caucasian and 37 percent identify themselves as some other race; 81.6 percent of residents are of Hispanic origin, which is nearly double that of the county with next highest percentage (Harding County is 44.9 percent Hispanic). Roger Mills County has the highest percentage of Caucasians at 91.8 percent and American Indians and Alaska Natives at 5.5 percent. Both the Hispanic and American Indian cultures have a strong presence in the study area. Residents of these descents have strong ties to the land and its natural resources and associate important values with use of the Grasslands. However, many subsistence users live on the west side of Mora County in villages such as Mora, Holman, and Guadalupita and may affiliate with the Carson and Santa Fe National Forests more than the Grasslands.

**Table 30. Race and ethnic distribution of total population by county, state and United States**

| County | Caucasian | African American | American Indian & Alaska Native | Asian/ Pacific Islander | Other Race | Two or More Races | Hispanic Origin (of any race) |
|---|---|---|---|---|---|---|---|
| Harding County, NM | 84.3% | 0.4% | 1.4% | 0.0% | 10.6% | 3.3% | 44.9% |
| Mora County, NM | 58.9% | 0.1% | 1.1% | 0.1% | 37.0% | 2.8% | 81.6% |

**Table 30. Race and ethnic distribution of total population by county, state and United States**

| County | Caucasian | African American | American Indian & Alaska Native | Asian/ Pacific Islander | Other Race | Two or More Races | Hispanic Origin (of any race) |
|---|---|---|---|---|---|---|---|
| Union County, NM | 80.4% | 0.0% | 1.0% | 0.4% | 16.0% | 2.2% | 35.1% |
| Cimarron County, OK | 85.8% | 0.6% | 1.0% | 0.2% | 9.9% | 2.5% | 15.4% |
| Roger Mills County, OK | 91.8% | 0.3% | 5.5% | 0.1% | 0.5% | 1.9% | 2.6% |
| Dallam County, TX | 82.6% | 1.6% | 0.9% | 0.2% | 12.4% | 2.2% | 28.4% |
| Gray County, TX | 82.2% | 5.8% | 0.9% | 0.4% | 8.2% | 2.4% | 13.0% |
| Hemphill County, TX | 87.6% | 1.6% | 0.7% | 0.3% | 8.5% | 1.3% | 15.6% |
| NM | 66.8% | 1.9% | 9.5% | 1.2% | 17.0% | 3.6% | 42.1% |
| OK | 76.2% | 7.6% | 7.9% | 1.5% | 2.4% | 4.5% | 5.2% |
| TX | 71.0% | 11.5% | 0.6% | 2.8% | 11.7% | 2.5% | 32.0% |
| United States | 75.1% | 12.3% | 0.9% | 3.7% | 5.5% | 2.4% | 12.5% |

Source: U.S. Census Bureau 2000.

### Environmental Justice

Executive Order (EO) 12898 (Office of the President 1994) directs Federal agencies to focus attention on the human health and environmental conditions in minority[21] and low income communities[22]. The purpose of EO 12898 is to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects[23] on minority and low income populations.

Environmental justice means that, to the extent practicable and permitted by law, all populations are provided the opportunity to comment before decisions are rendered on, are allowed to share in

[21] Minority means a person who is a member of the following population groups: American Indian or Alaska Native; Asian or Pacific Islander; Black, not of Hispanic origin; or Hispanic (USDA DR 5600-002, 1997).

[22] Low income population means any readily identifiable group of low income persons who live in geographic proximity to, and, if circumstances warrant, migrant farm workers and other geographically dispersed/transient persons who will be similarly affected by USDA programs or activities. Low income populations may be identified using data collected, maintained and analyzed by an agency or from analytical tools such as the annual statistical poverty thresholds from the Bureau of the Census' Current Population Reports, Series P-60 on Income and Poverty (USDA DR 5600-002, 1997).

[23] Human health and/or environmental effects as used in this Departmental Regulation include interrelated social and economic effects (USDA DR 5600-002, 1997).

the benefits of, are not excluded from, and are not affected in a disproportionately high and adverse manner by government programs and activities affecting human health or the environment.

Environmental justice is the fair treatment and meaningful involvement of people of all races, cultures, and incomes, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. The goal of environmental justice is for Federal agency decision makers to identify impacts that are disproportionately high and adverse with respect to minority and low income populations[24] and identify alternatives that will avoid or mitigate those impacts.

The emphasis of environmental justice is on health effects and/or the benefits of a healthy environment. The Council on Environmental Quality (CEQ) has interpreted health effects with a broad definition: "Such effects may include ecological, cultural, human health, economic or social impacts on minority communities, low income communities or Indian tribes…when those impacts are interrelated to impacts on the natural or physical environment" (Council on Environmental Quality 1997).

Table 30 (above) reports the ethnic distributions of the counties in the study area, their respective states, and the United States. All counties except for Roger Mills have a higher proportion of Hispanic residents than the United States; and Roger Mills County has the highest proportion of American Indian residents in the study area. Mora County has the lowest proportion of Caucasian residents at 58.9 percent. Due to the high proportion of Hispanic and American Indian residents in the study area, it has been determined that these ethnic groups meet the environmental justice requirements of a minority population meaningfully greater than the general population. (The general population that county data is compared to is that of the Nation.) Therefore, decision makers on the Grasslands should pay careful attention to the potential impacts of management actions on those ethnic groups.

Table 31 reports the number of individuals below the poverty level and poverty rates in 2000 and 2008. Poverty rates in six of the eight counties decreased from 2000 to 2008; however, poverty rates remain high in the study area. As of 2008, Mora County has the highest poverty rate at 23 percent and Hemphill County had the lowest at 8.7 percent. Hemphill and Roger Mills are the only counties with 2008 poverty rates less than the national average. Such rates suggest that a substantial proportion of the existing population should be considered as a low income group. Therefore, decisions regarding future management actions on the Grasslands should carefully assess the effects on low income populations.

In cases where the management decisions are expected to create jobs and income in the local economy, it is unlikely that there would be a disproportionate adverse effect on minority and low income populations. Individuals in those populations may benefit from any increase in jobs and income in the area. Alternatively, future management decisions that may negatively impact local employment and income conditions should carefully assess the distribution of effects across population demographics, paying careful attention to Hispanic, American Indian, and low income populations.

[24] Minority population/communities means any readily identifiable group of minority persons who live in geographic proximity to, and, if circumstances warrant, migrant farm workers and other geographically dispersed/transient persons who will be similarly affected by USDA programs or activities (USDA DR 5600-002, 1997).

**Table 31. Poverty status by county, state, and United States for 2000 and 2008**

| County | 2000 | | 2008 | |
|---|---|---|---|---|
| | Number | Percent | Number | Percent |
| Harding County, NM | 115 | 14.7 | 104 | 15.2 |
| Mora County, NM | 1,250 | 24.2 | 1,154 | 23.0 |
| Union County, NM | 677 | 17.0 | 602 | 16.0 |
| Cimarron County, OK | 453 | 15.0 | 409 | 16.3 |
| Roger Mills County, OK | 480 | 14.5 | 386 | 11.5 |
| Dallam County, TX | 989 | 16.0 | 840 | 13.6 |
| Gray County, TX | 3,138 | 9.8% | 3,018 | 14.7 |
| Hemphill County, TX | 313 | 15.3% | 290 | 8.7 |
| NM | 309,103 | 17.3% | 329,857 | 17.0 |
| OK | 467,081 | 13.8% | 554,237 | 15.7 |
| TX | 3,041,115 | 14.6% | 3,755,944 | 15.8 |
| United States | 31,581,086 | 11.3% | 39,108,422 | 13.2 |

Source: U.S. Census Bureau, Small Area Income and Poverty Estimates 2010.

### Economic Conditions and Trends

Employment and income statistics are important indicators of economic health. Table 32 lists the total jobs in the study area by sector. Agriculture supports the largest percentage of jobs in the study area. Many of the activities on the Grasslands support jobs in that sector, making it a valuable source of economic stimulus. The second largest sector is the government, which include jobs on the Grasslands. Government jobs tend to be higher paying than jobs in other sectors of rural economies and are an important source of household income.

Another indicator of economic health is the level of unemployment. All counties in the study area, except for Mora County, have generally maintained an unemployment rate lower than their respective state average in recent years. Mora County has the highest unemployment rate in the study area, much greater than that of its respective state. As jobs are created in a region, labor comes from two primary sources: local unemployment and in-migration of households. With the higher unemployment rates in Mora County, it is likely that any new demands for labor would be supplied from the local labor market; assuming that qualified individuals reside in the area. One exception to this has been jobs in the mining sector. These jobs tend to be shorter term and filled by a transient workforce that does not take up residency in the area. This will be addressed in greater detail in the effects analysis that follows.

**Table 32. Number of jobs and percent of total jobs by sector in the study area**

| Sector | Number of Jobs | Percent |
|---|---|---|
| Agriculture | 6,500 | 21.6 |
| Mining | 2,011 | 6.7 |
| Utilities | 143 | 0.5 |
| Construction | 1,784 | 5.9 |
| Manufacturing | 1,566 | 5.2 |
| Wholesale Trade | 1,115 | 3.7 |
| Transportation and Warehousing | 3,205 | 10.6 |
| Retail Trade | 1,120 | 3.7 |
| Information | 320 | 1.1 |
| Finance and Insurance | 830 | 2.8 |
| Real Estate and Rental and Leasing | 544 | 1.8 |
| Professional, Scientific, and Technical Services | 510 | 1.7 |
| Management of Companies | 19 | 0.1 |
| Administration, Waste Management, and Removal Services | 755 | 2.5 |
| Educational Services | 122 | 0.4 |
| Health Care and Social Assistance | 1,439 | 4.8 |
| Arts, Entertainment, and Recreation | 362 | 1.2 |
| Accommodation and Food Services | 1,411 | 4.7 |
| Other Services | 2,114 | 7.0 |
| Government | 4,261 | 14.1 |
| Total | 30,131 | 100.0 |

Source: MIG 2008.

Income available to local residents directly impacts their ability to purchase goods and services. Residents of the study area received a total of 1.4 billion dollars of personal income in 2006. Income was generated from the following sources and proportions: payments for labor (62 percent); transfer payments (21 percent); and dividends, interest and rent (17 percent). The "Social-economic Specialist Report" associated with this section of the FPEIS provides more information on labor and nonlabor income. The majority of income for local residents is generated by wage and salary income (44 percent of all labor); however, a considerable amount of income in the study area is earned through nonlabor sources (EPS 2008).

### Payments in Lieu of Taxes

"Payments in Lieu of Taxes" (or PILT) are Federal payments to local governments that help offset losses in property taxes due to nontaxable Federal lands within their boundaries.

In 2010, counties in New Mexico received $32,205,935 in total PILT payments from the Federal government; counties in Oklahoma received $2,582,013; and counties in Texas received $4,501,553.

## Environmental Consequences

The first section below, "Economic Impact Analysis," describes the economic impact of the four revenue-generating activities the Forest Service manages on the Grasslands. The economic impact is estimated as the number of jobs and labor income generated from sale of products, permits for various activities, and mineral leases and royalties. The programs generating revenue are minerals, livestock grazing, recreation, and nonrecreation special uses.

The second section is the "Economic Efficiency Analysis." The efficiency analysis estimates the present net value (PNV) for each alternative. PNV is the measure of the economic value of a project when costs and revenues (benefits) occur in different time periods. This analysis allows the decision maker to compare the value of managing these business areas under each alternative.

The third section contains a description of the social and economic consequences for each alternative. The social consequences are qualitative; the economic consequences are quantitative using the values reported in the impact and efficiency analyses.

The "Economic Resource Specialist Report" associated with this section of the FPEIS provides more detail on the application of models, assumptions, and special considerations to the economic analyses.

### Economic Impact Analysis

Economic impacts were modeled using IMPLAN[25] Professional Version 3.0 and the Forest Economic Analysis Spreadsheet Tool (FEAST)[26], with data from the average of a 3-year range (typically, 2005 to 2007). Data on use levels were collected from forest resource specialists, any change noted is based on their professional expertise (1982 Rule, 219.12(g)).

Jobs and income economic impacts are shown as being common for all alternatives. The economic activity stimulated by Grasslands management is a very small proportion of total activity in the study area. Under current management, the total Grasslands contribution accounts for only 0.49 percent of total employment and 0.59 percent of total labor income. Any impacts

[25] Data reported by the Minnesota IMPLAN Group (MIG) is used to assess the relative size of sectors in a local economy. MIG reports annual data for all counties in the United States. IMPLAN employment data is reported by economic sectors grouped together according to similarities in the goods and services offered. IMPLAN data used for this analysis is for the year 2008. IMPLAN stands for "Impact Analysis for Planning."

[26] FEAST is a Microsoft Excel-based workbook designed to describe impacts to employment and income by resource program and major industry. To conduct the economic impact and economic efficiency analyses, IMPLAN models are imported into FEAST. This provides an assessment of the overall importance of these lands to the local economy in terms of jobs and income supported.

resulting from implementation of alternatives A, B, or C would not generate a noticeable effect on economic conditions overall.

The annual economic contribution for each resource program (table 33) is estimated as the number of jobs and labor income supported from activities taking place on the Grasslands. The resource area with the largest economic contribution is minerals, supporting 52 jobs and $5.204 million of labor income in the study area. Oil and gas are the most abundant minerals commodities extracted from the Grasslands; however, all of that activity occurs on the BK. Ecosystems restoration and other Forest Service expenditures also have an important contribution to the local economy, supporting 23 and 21 jobs respectively. Agriculture is a way of life for many local residents, therefore, grazing is an important resource. Currently, grazing permits on the Grasslands support an additional 32 jobs in the study area. Those 32 jobs are very important to local agricultural families who would like continued management for the grazing resource. In aggregate, current Grasslands management supports 154 jobs and $7.217 million of labor income.

**Table 33. Economic contribution by resource program**

| Resource | Number of Jobs | Labor Income ($1,000s) |
|---|---|---|
| Recreation: non-local only | 4 | $85 |
| Wildlife and Fish: non-local only | 4 | $83 |
| Grazing | 32 | $542 |
| Timber | 0 | $0 |
| Minerals | 52 | $5,204 |
| Ecosystem Restoration | 23 | $693 |
| Payments to States/Counties | 17 | $610 |
| Forest Service Expenditures | 21 | $0 |
| Total Grasslands Management | 154 | $7,217 |

Source: MIG 2008 and FEAST 2010.

***Note:*** Contributions for each resource area do not constitute total employment or income within industry sectors that correspond to these resource areas (agriculture, mining, etc.). In fact, economic contributions for each resource area in table 33 (above) represent employment and income across multiple industry sectors.

Jobs and income associated with Grasslands management are distributed across industry sectors within the study area (table 34). The jobs and income for each industry is attributable to economic activity as a result of Grasslands management and thus, is not a representation of total employment within the impact area for that industry. The total jobs and labor income contributed only accounts for 0.51 percent and 0.60 percent of study area totals, respectively. However, that is valuable economic stimulus for those impacted. Agriculture is affected the most with 55 jobs, followed by mining with 29 jobs, and government with 26 jobs. As measured proportionally, mining makes the largest contribution at 1.44 percent of total employment and 2.06 percent of total labor income (Grasslands only).

**Table 34. Economic contribution by sector**

| Sector | Employment (Number of Jobs) | | | Labor Income ($1,000s) | | |
|---|---|---|---|---|---|---|
| | Study Area Total | Grasslands Contri-bution | Percent of Total | Study Area Total | Grasslands Contri-bution | Percent of Total |
| Agriculture | 6,500 | 55 | 0.85 | 85,976 | $1,202 | 1.40 |
| Mining | 2,011 | 29 | 1.44 | 211,251 | $4,352 | 2.06 |
| Utilities | 143 | 0 | 0.01 | 13,996 | $50 | 0.36 |
| Construction | 1,784 | 4 | 0.22 | 90,555 | $272 | 0.30 |
| Manufacturing | 1,566 | 0 | 0.00 | 134,206 | $3 | 0.00 |
| Wholesale Trade | 1,115 | 2 | 0.19 | 71,824 | $148 | 0.21 |
| Transportation and Warehousing | 3,205 | 1 | 0.03 | 80,945 | $60 | 0.07 |
| Retail Trade | 1,120 | 8 | 0.72 | 78,297 | $201 | 0.26 |
| Information | 320 | 1 | 0.32 | 14,590 | $26 | 0.18 |
| Finance and Insurance | 830 | 2 | 0.26 | 43,885 | $128 | 0.29 |
| Real Estate and Rental and Leasing | 544 | 1 | 0.20 | 20,900 | $53 | 0.25 |
| Professional, Scientific, and Technical Services | 510 | 2 | 0.40 | 27,159 | $112 | 0.41 |
| Management of Companies | 19 | 0 | 0.00 | 1,741 | $10 | 0.58 |
| Administration, Waste Management and Removal Services | 755 | 1 | 0.14 | 23,292 | $35 | 0.15 |
| Educational Services | 122 | 0 | 0.00 | 1,862 | $6 | 0.32 |
| Health Care and Social Assistance | 1,439 | 4 | 0.28 | 48,295 | $129 | 0.27 |
| Arts, Entertainment, and Recreation | 362 | 1 | 0.28 | 6,389 | $20 | 0.31 |
| Accommodation and Food Services | 1,411 | 9 | 0.64 | 21,425 | $144 | 0.67 |
| Other Services | 2,114 | 4 | 0.19 | 42,906 | $66 | 0.15 |
| Government | 4,261 | 26 | 0.61 | 182,048 | $201 | 0.11 |
| Total | 30,131 | 154 | 0.51 | 1,201,543 | $7,217 | 0.60 |

Source: MIG 2008 and FEAST 2010.

The resource programs currently managed by the Grasslands generate revenue from sale of products, permits for various activities, and leases for minerals. The programs generating revenue are recreation, range, minerals, and nonrecreation special uses. Grasslands personnel provided current data on revenue streams (table 35). A 3-year average for each resource program's budget was used as an estimate of annual costs.

**Table 35. Annual revenues and costs by program**

| Program | Annual Revenue | Annual Cost |
|---|---|---|
| Recreation | $18,000 | $242,250 |
| Range | $165,042 | $233,524 |
| Minerals | $13,468,000 | $445,252 |
| Nonrecreation Special Uses | $58,000 | $7,393 |

### Economic Efficiency Analysis

Economic efficiency is required by the 1982 Rule. Estimating present net value (PNV) is required by 219.12(g); however, the decision maker is not required by 219.12(j) to select the alternative that maximizes PNV. He or she only needs to identify each alternative's PNV and compare them to the selected alternative.

Economic efficiency analysis was conducted with QuickSilver[27] Version 6. Data on program revenues were collected from the Final National Forest Statement of Receipts (ASR-13-1). Data on program costs were provided by the Cibola NF budget staff (1982 Rule, 219.12(e)).

The recreation, range, minerals, and nonrecreation special uses programs are funded under the general budget, externally funded activities such as volunteer and service agreements, and in-kind sharing. There is much uncertainty about future budgets and no reliable data on future program costs, however, a variety of ecosystem services projects are part of the management strategy for the Grasslands, and are reflected in the costs for implementing alternatives B and C, which would be slightly higher than the costs for implementing alternative A. The economic efficiency analysis is limited to only the revenues received from management activities and the costs of annually funded programs. The costs included in this analysis are just a portion of the total operating budget. PNV is defined as the discounted sum of benefits minus the discounted sum of costs; however, since not all costs are actually accounted for, this analysis should primarily be used to evaluate benefits. A federally prescribed discount rate of 4 percent is used in this analysis (USDA Forest Service 1992). Inflation is also a variable that can affect the PNVs, but for purposes of this analysis inflation was left at zero.

Table 36 reports the results of the economic efficiency analysis. There is limited data on the costs to implement projects during the next planning cycle, and current revenues for each resource program are assumed to continue during future years. The values reported in table 36 are only used to compare the expected differences between alternatives, and not the actual value of

[27] Quick Silver is a Forest Service program for economic analysis of long-term, on-the-ground resource management projects.It provides a consistent benefit/cost, efficiency analysis framework to determine if one management action costs less, or has a better payoff than others.

implementation. There is essentially no difference between alternatives; the largest difference is not economically significant.

Again, there are very few differences among the alternatives. Alternatives B and C are not expected to result in a change in revenues back to the Grasslands. Therefore, the same program revenues used for alternative A are also used for alternatives B and C. (See the affected environment for the respective resource areas for revenues and costs by program area.) The expected costs of implementing any alternative are assumed to be the same except that alternatives B and C place greater emphasis on vegetation management, which would increase restoration costs. This is reflected in slightly higher present value costs and lower PNV for alternatives B and C than alternative A. No significant economic impacts are anticipated if any alternative were to be implemented. The effects reported represent a very small proportion of economic activity in the study area.

This economic efficiency analysis is very limited due to the lack of data availability and site-specific prescriptions in the alternatives. The PNVs reported in this document are a measure of discounted revenues with limited information on costs.

**Table 36. Results from the economic efficiency analysis**

| | Alternative A | Alternative B | Alternative C |
|---|---|---|---|
| Present Value — Benefits | $158,519,338 | $158,519,338 | $158,519,338 |
| Present Value — Costs | -$6,110,174 | -$7,388,664 | -$7,388,664 |
| Present Net Value | $152,409,164 | $151,130,674 | $151,130,674 |

## Consequences Common to All Alternatives

### Social Consequences

Relationships between the grazing permittees and Forest Service are necessarily close, as they work in partnership to maintain range facilities, monitor forage production and utilization, and determine appropriate stocking levels and the timing of allowable use. Adjustments to stocking levels or grazing management strategies continue to be made in annual operating instructions as needed based on site-specific conditions. This would result in vital partnerships with local communities that have stable populations under all alternatives.

### Economic Consequences

Under the management direction of alternatives A, B, and C, the Grasslands would continue to contribute to the livelihoods of local residents and stakeholders in a variety of ways. They would contribute to jobs and income through employment opportunities with the U.S. Forest Service, as well as employment and income associated with industry outputs dependent on NFS lands. For example, a portion of output in the tourism, recreation, and agricultural industries is generated from activities affected by Grasslands management; this would continue. Oil and gas leases would continue to generate economic activity in the mining sector, which in turn would support jobs and income among local residents. These lands would continue to support subsistence activities through hunting and fishing, firewood harvesting, and the gathering of other forest products. Such dependency on the Grasslands for economic sustainability and growth is largely a

function of the local economic dynamic and total industrial outputs, this would likely continue. Economic dependency in the study area is likely to vary across cities and towns; however, the data available does not allow for the estimate of contributions to such microeconomies. The Grasslands' anticipated contributions to the local region are estimated as a whole, and certain economic dependency issues are addressed qualitatively.

Oil and gas extraction would continue to be a common activity on the Grasslands. Any change in extraction levels is assumed to be a result of market demands and not the plan itself. Therefore, it is assumed that the minerals jobs and labor income reported above would continue to be supported under all alternatives. During the next planning cycle, it is expected that demand for the development of wind energy on the Grasslands is likely to increase. However, proposed development for any mineral or energy source, including utility easements or transmission corridors, must undergo a review process. That process would not change under any alternative. Effects analysis should be completed once such site-specific proposals are presented to the Agency.

According to the 1985 plan (alternative A), livestock grazing is currently at the maximum permitted use; this would not change under alternative B or C. Grazing levels would not rise higher than current use; however, they might decrease due to weather conditions or other unforeseen climatic circumstances. As a result, during drought years when forage is limited, authorized stocking levels may be reduced to protect ecosystem diversity.

Although the populations in communities around the Grasslands are declining, visitation from cities outside the area is gradually increasing and producing a change in recreation uses. Camping, often in association with hunting or fishing, would remain one of most prevalent recreation activities on all four Grasslands. Increases in recreation visitation would support economic development under alternatives A, B, and C.

## Alternative A

### Social Consequences

Because there would be no change in the management of livestock grazing, minerals and energy development, or recreation, there would be no significant social consequence if this alternative were selected.

### Economic Consequences

Local businesses and firms would continue to depend heavily upon agricultural and natural resource based activities as a source of revenue. For recreation only activity supported by nonlocal visitors is accounted for. Recreation expenditures by nonlocals represent new money to the economy, and are considered an export of goods and services. Recreation use by local residents does not introduce new money to the economy, and is not considered to have an economic impact.

The information reported in table 33 and the third and sixth columns of table 34 above represent the economic contribution under alternative A. If this alternative were selected, it is assumed that this level of jobs and income would continue to be supported. There would be no impact to the local economy and, therefore, no direct or indirect consequences can be measured. Under alternative A, it is assumed there would be no impact to these revenue streams, and they would

continue throughout the next planning cycle. Since plans are expected to be updated every 10 to 15 years, a 15-year planning cycle is used for the economic efficiency analysis.

The PNV if Grasslands management were to continue under alternative A is $152,409,164. In this analysis, costs are limited to only those for specific program areas and ecosystem services projects occurring on the Grasslands. Therefore, this value provides a better relative measure of the discounted net revenue the Grasslands are expected to generate during the next planning cycle in 2010 dollars. The programs generating revenue for the Grasslands are recreation, range, minerals, and nonrecreation special uses. These programs would continue to generate revenue from the sale of products, permits for various activities, leases, and mineral royalties.

## Alternative B

### Social Consequences

Overall, there are no social consequences anticipated for this alternative. Individual projects such as the 2012 travel management decision could impact certain user groups and stakeholders; however, those effects cannot be estimated at this time. Adaptive management is a common theme among forest planning efforts; therefore, some variability must be left in the plan so that managers can adapt livestock management to changing ecological conditions.

### Economic Consequences

The jobs and income supported under the current budget are reported under the “Economic Conditions and Trends” section and described in the economic impact analysis. It is assumed that those jobs will continue to be supported during the next planning cycle under this alternative barring any unforeseen circumstances with the budget. There would be no significant economic consequences associated with this alternative.

The primary resource areas on the Grasslands are minerals, livestock grazing, and recreation. General expenditures by the Agency are also contributors to the local economy. It is difficult to forecast how implementation of this alternative would impact each resource area on any given year. Recreation use is largely dependent on population growth and preferences of visitors. Grazing is influenced by weather conditions during the season, and minerals extraction is dependent on energy demand and global prices. Agency expenditures are largely a function of appropriated budget and some external funding. All of these factors introduce substantial uncertainty to models estimating the effects of this alternative.

The PNV for alternative B was calculated using the same methods as described under alternative A. Alternative B places a greater emphasis on vegetation management, which will increase restoration costs. This is reflected in a slightly lower PNV than alternative A. The PNV for this alternative is $151,130,674 (see table 36, above). Although this PNV is lower than alternative A, it does not account for nonfinancial benefits associated with the improved vegetative conditions.

## Consequences Common to Alternatives B and C

### Economic Consequences

Under alternatives B and C, undesirable trees species could be removed if it would improve native habitat or move a vegetation type toward desired vegetation structure and species composition. A detailed description of the effects associated with that type of project would be

reported in that analysis. Removal of undesirable trees would involve eradicating trees through thinning or mastication. Either treatment would represent a minimal impact to the overall economy; however, this activity would result in a net increase in jobs (a few jobs), and it is likely that local families would benefit from the increase in employment.

## Alternative C

Alternative C is similar to alternative B except that a recommendation would be made to designate the Canadian River PWA. Plan components for wilderness would be developed and wilderness regulations as outlined in FSM 2300, Chapter 2320, would be triggered.

### Social Consequences

Wilderness designation may have social consequences to recreation uses in Mills Canyon. It is unlikely that annual visitation rates will decrease. While overall annual visitation rates would likely remain the same, the distribution of activity types taking place on the Mills units may change. There would likely be an increase in nonmotorized recreation and motorized recreation would be expected to decrease. However, nonmotorized recreation is likely to increase at a rate greater than under alternatives A or B.

### Economic Consequences

No significant economic impacts are anticipated if alternative C were to be implemented. The effects reported above represent a very small proportion of economic activity in the study area. Individual projects could impact certain user groups and stakeholders; however, those effects cannot be estimated at this time.

This alternative is not expected to result in a change in revenues to the Grasslands. Therefore, the same program revenues used for alternatives A and B are also used for this alternative. The expected costs of implementing alternative C are assumed to be the same as alternative B. Therefore, the PNV for alternative C is also $151,130,674 (see table 36, above).

## Cumulative Consequences

Cumulative consequences include the total change in economic conditions that would result from the specifications under any alternative in conjunction with the direct and indirect effects of other present and reasonably foreseeable activities near the Grasslands. Based upon a review of other land use plans, no cumulative effects were identified. Projects affecting natural resources off-Grasslands are likely to have similar effects to those that would occur under alternatives A, B, or C. Individually, such projects may not have much bearing on the local economy; however, cumulatively, they may substantially impact economic conditions. Mining is a good example; a project to develop one oil and gas well may not have much bearing on communities in the study area, however, all mining projects together are likely to have important economic implications. There are no specific projects proposed under any alternative. Once actual activities are proposed, cumulative effects should be estimated for the resources affected.

There is potential for cumulative consequences as a result of wind energy development on private lands. Wind energy facilities that would be developed on private lands could affect Federal lands through the development of transmission corridors and access routes. This would have a social consequence due to modifications to scenic resources; and direct and indirect economic

consequences by creating jobs in numerous sectors and increased special use permits on NFS lands.

Over half of the special use permits on the BKMC NGs are related to oil and gas operations, and most permits on the KRB NGs are for power lines and road easements. Alternatives A, B, and C require joint use of designated corridors for large-scale utilities, such as interstate pipelines and high voltage transmission lines. The development of oil and gas due to increased market demand would result in more requests for utility and pipeline easements. The economic consequence would be increased jobs, permits, leases, and mineral royalties in the Grasslands counties.

## Unavoidable Adverse Effects

Decisions made in this Grasslands plan do not represent actual irreversible or irretrievable commitment of resources (see next section). The application of Grasslands-wide standards, guidelines, and resource protection measures would limit the extent and duration of any adverse environmental impacts. For a detailed discussion of types of consequences expected from future activities implemented under this LRMP, see specific topic areas in this chapter.

## Irreversible and Irretrievable Commitments of Resources

Irreversible commitments of resources are those that cannot be regained, such as the extinction of a species or the removal of mined ore. Irretrievable commitments are those that are lost for a period of time such as the temporary loss of timber productivity in forested areas that are kept clear for use as a power line rights-of-way or road.

The land management plan provides a programmatic framework that guides site-specific actions but does not authorize, fund, or carryout any project or activity. Because the land management plan does not authorize or mandate any site-specific activities or ground-disturbing actions, there can be no direct effects. However, there may be implications, or longer term environmental consequences, of managing the forests under this programmatic framework.

## Other Required Disclosures

NEPA at 40 CFR 1502.25(a) directs “to the fullest extent possible, agencies shall prepare draft environmental impact statements concurrently with and integrated with other environmental review laws and executive orders.”

Other sources of information, found in appendix D of the draft land and resource management plan includes existing laws, regulations, Forest Service policy or direction, and references to BMPs and best available science. These sources are important in designing projects and activities to achieve desired conditions. They are organized by resource area. Most, if not all of these relevant documents are available from Forest Service offices and many are posted on the Cibola National Forest and National Grasslands Web site.

# Chapter 4. Consultation and Coordination

## Preparers and Contributors

### ID Team Members/Preparers

| Name | Title | Highest Degree | Years of Experience |
|---|---|---|---|
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## Federal, State, and Local Agencies

The Forest Service consulted the following individuals, Federal, state, and local agencies, tribes and non-Forest Service persons during development of this draft environmental impact statement:

Bureau of Land Management, Oklahoma Field Office
USDA, Natural Resources Conservation Service
U.S. Fish and Wildlife Service, New Mexico Ecological Services Field Office
U.S. Fish and Wildlife Service, Texas Ecological Services Field Office
U.S. Fish and Wildlife Service, Oklahoma Ecological Services Field Office
Playa Lakes Joint Venture
New Mexico Department of Game and Fish
Oklahoma Department of Wildlife Conservation
Texas Parks and Wildlife Department
Mora County, New Mexico
Harding County, New Mexico
Union County, New Mexico
Colfax County, New Mexico
Cimarron County, Oklahoma
Roger Mills County, Oklahoma
Dallam County, Texas
Gray County, Texas
Hemphill County, Texas
Canadian River Riparian River Restoration Project – Participating Soil and Water Conservation Districts

## Tribes

Apache Tribe of Oklahoma
Cheyenne and Arapaho Tribes
Comanche Nation
Kiowa Tribe
Jicarilla Apache Nation
Mescalero Apache
Wichita and Affiliated Tribes

## Others

Brad Grice
New Mexico Wilderness Alliance
Shaw Ranch, Inc.
National Wild Turkey Federation

# Glossary

**Access** – Road or trail route over which a public agency claims a right-of-way for public use; a way of approach.

**Accessibility** – According to Section 504 of the Rehabilitation Act of 1973, all Federal programs and facilities are required to be "to the highest degree feasible, readily accessible to and useable by all persons who have a disability, including mobility, visual, hearing or mental impairments."

**Active flood plain** – The area of alluvial soils adjacent to rivers or streams that is flooded on a periodic basis. There is evidence of recently rafted debris or fluvial sediments deposited on the soil surface or on trees or other vegetation, or recent scarring of trees or shrubs by material moved by floodwaters.

**Adaptive management** – A system of management practices based on clearly identified outcomes and monitoring to determine if management actions are meeting desired outcomes, and if not, to facilitate management changes that will best ensure that outcomes are met or reevaluated. Adaptive management stems from the recognition that knowledge about natural resource systems is sometimes uncertain (1982 Rule Provisions, Section 219.27; FSM 1905).

**Administrative site** – A site which primarily exists for general administrative purposes. It normally will include office, warehouse, outside storage, and parking areas. It may include housing and pasture for livestock. A work center may be part of an administrative headquarters site.

**Age class** – Interval of years, commonly 20, into which trees are grouped for management. Example: 1 to 20 years, 21 to 40 years.

**Allotment** – A designated area available for livestock grazing upon which a specified number, kind of livestock, and season of use may be grazed under a term grazing permit. The basic land unit used to facilitate management of the range resource on National Forest System and associated lands administered by the Forest Service.

**Alluvial deposits** – Clay, silt, sand, gravel, or other rock materials transported by flowing water and deposited in comparatively recent geologic time as sorted or semisorted sediment in riverbeds, estuaries, flood plains, lakes, shores, and in fans at the base of mountain slopes.

**Alternative energy** – Methods of energy production that do not rely on traditional sources such as fossil fuels.

**Amenity** – The pleasurable, educational, or aesthetic features of the land or resources.

**Application for permit to drill (APD)** – An application to drill a well submitted by a lessee or operator to the BLM. The APD consists of a drilling plan that discusses downhole specifications and procedures (reviewed by the BLM) and a surface use plan of operations (SUPO) that examines surface uses, including roads, well site layout, cut/fill diagrams, reclamation procedures, production facility locations, etc. (reviewed by the Forest Service). The approved APD is a contract between the operator and Federal government and cannot be changed or modified unless authorized by the BLM and FS.

**Aquatic ecosystem** – The stream channel or lakebed, water, or biotic communities and the habitat features that occur there.

**Aquifer** – A geologic formation, group of formations, or part of a formation that contains sufficient saturated permeable material to yield significant quantities of water to wells and springs.

**At-risk community** – an area that is comprised of (1) an interface community as defined in the notice entitled "Wildland Urban Interface Communities Within the Vicinity of Federal Lands That Are at High Risk from Wildfire" issued by the Secretary of Agriculture and the Secretary of the Interior in accordance with Title IV of the Department of the Interior and Related Agencies Appropriations Act, 2001 (114 Stat. 1009) (66 Fed. Reg. 753, January 4, 2001); or a group of homes and other structures with basic infrastructure and services (such as utilities and collectively maintained transportation routes) within or adjacent to Federal land; an area in which conditions are conducive to a large-scale wildland fire disturbance event; an area for which a significant threat to human life or property exists as a result of a wildland fire disturbance event.

**Authorized officer** – Any Forest Service officer to whom authority for disposal of mineral materials has been delegated (36 CFR228.42).

**Auto tour routes** – An audio guided tour by vehicle, which follow the route of a national historic trail or scenic byway. These types of tours are generally provided by other agencies such as the state or National Park Service and are provided in an electronic file format or on CD.

**Background** – The distant part of the landscape. The landscape area located 4 miles to infinity from the viewer.

**Bald** – Sparsely vegetated knoll.

**Bank cover** – Anything, usually vegetation, that provides protection from erosive effects on the land rising from and bordering a water body such as a stream or lake.

**Bank erosion** – The removal of soil and rocks by running water, wind, or waves from the land rising from and bordering a water body such as a stream or lake.

**Bankhead-Jones Farm Tenant Act** – Authorizes the Secretary of Agriculture to develop a program of land conservation and utilization in order to correct maladjustments in land use and to assist in controlling soil erosion, promoting reforestation, preserving natural resources, protecting fish and wildlife, developing and protecting recreational facilities, mitigating floods, preventing impairment of dams and reservoirs, conserving surface and subsurface moisture, protecting the watersheds of navigable streams, and protecting the public's health, safety, and welfare.

**Bedload** – Sand, silt, gravel, soil, or detritus carried by a stream on or immediately above the bottom.

**Best management practice (BMP)** – The method, measure, or practice selected by an agency to meet its nonpoint-source pollution control needs. BMPs include, but are not limited to, structural controls, operations, and maintenance procedures. BMPs can be applied before, during, or after pollution producing activities to reduce or eliminate the introduction of pollutants into the water.

**Biodiversity** – The range of organisms present in a particular ecological community or system. It can be measured by the numbers and types of different species, or by the genetic variations within and between species.

**Caliche** – A sedimentary rock, a hardened deposit of calcium carbonate. This calcium carbonate cements together other materials, including gravel, sand, clay, and silt. It is found in aridisol and mollisol soil orders. Caliche occurs worldwide, generally in arid or semiarid regions.

**Canopy** – (1) The vertical projection downward of the aerial portion of vegetation, usually expressed as a percent of the ground so occupied; (2) A generic term referring to the aerial portion of vegetation (USDA NRCS, 2003).

**Canopy cover** – The percentage of ground covered by a vertical projection of the outermost perimeter of the natural spread of foliage of plants. Small openings within the canopy are included (USDA NRCS, 2003).

**Cavity tree** – A tree with a hollow space that provides potential nesting habitat for birds or small mammals.

**Channel** – A passage, either naturally or artificially created, that periodically or continuously contains moving water, or that forms a connecting link between two bodies of water. River, creek, stream, run, branch, and tributary are some of the terms used to describe natural channels. Natural channels may be single or braided. Canal and floodway are some of the terms used to describe artificial channels.

**Climate change** – Climate change refers to a statistically significant variation in either the mean state of the climate or in its variability, persisting for an extended period (typically 30 years or longer). Climate change may be due to natural internal processes or external forces, or to persistent anthropogenic changes in the composition of the atmosphere or in land use. Note that the United Nations Framework Convention on Climate Change (UNFCCC), in its Article 1, defines “climate change” as “a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.” The UNFCCC thus makes a distinction between “climate change” attributable to human activities altering the atmospheric composition, and “climate variability” attributable to natural causes. See also “Climate variability.”

**Closed basin** – An enclosed region having no drainage outlet and from which water escapes only by evaporation or infiltration.

**Closed-loop drilling system** – A drilling system that collects lubricants, fluids, drilling mud, and other additives in a tank, as opposed to an open pit.

**Codominant** – One of two or more species that are equally dominant in a biotic community.

**Common mineral** – Also known as mineral materials. A collective term used to describe petrified wood and common varieties of sand, gravel, stone, pumice, pumicite, cinders, clay, and other similar materials. Common varieties do not include deposits of those materials which are valuable because of some property giving them distinct and special value (36 CFR 228.42). The determination of which minerals are considered common variety is made by the Bureau of Land Management.

**Condition survey** – A tool used to document the condition of a given facility. The facilities are measured against maintenance objectives and standards for health and safety.

**Conditions of approval (COA)** – Site-specific mitigation which is applied at the time of the approval of the surface use plan of operations (SUPO). Mitigation under COA cannot move an operation more than 200 meters, or site operations off of a leasehold, or prohibit new surface-disturbing operations for a period of more than 60 days in any 1 year (43 CFR 3101.1-2.). If COA mitigation is within this parameter, it is considered consistent with lease rights. Mitigation more restrictive than this cannot be applied using a COA and requires a lease stipulation.

**Constructed featur**e – Anything constructed by the Forest Service or by a permittee for use in administering the national grasslands. When used in the context of scenery, the term refers to anything that is built on the landscape.

**Controlled surface use** – Allowed use and occupancy, unless restricted by another stipulation, with identified resource values requiring special operational constraints that may modify the lease rights. CSU is used as an operating guideline, not as a substitute for no surface occupancy (NSO) or timing stipulations.

**Corridor** –A band of forest, shrub, or native grass land connecting discontinuous patches of same which enhance connectivity and facilitate the movement of animals and plants that have a limited cruising range. See “Wildlife corridors,” “Forest fragmentation.”

**Creek draw** – Usually a dry creekbed or gulch that temporarily fills with water after a heavy rain or fills seasonally. The term usually applies to a mountainous desert environment.

**Crowned** – Shaped to provide for proper drainage away from the center toward the outside of the road.

**Depressional wetland (seasonal and perennial)** – Depressional wetlands are places where runoff accumulates in a topographic depression. Water either does not flow through the wetland or the flow is essentially imperceptible. Ponds on fault traces, valley bottoms, and on broad saddles along ridges are examples of natural depressional wetlands. Depressional wetlands can be perennial or seasonal. Perennial depressional wetlands have some amount of standing water for at least 9 months during most years. Seasonal depressional wetlands have no standing water, or it lasts for less than 9 months during most years.

**Design capacity** – The maximum number of visitors that can be accommodated by the facilities at a particular site.

**Designated road, trail, or area** – Routes and areas designated on the motor vehicle use map and established by a decision that is compliant with the 2005 Travel Management Rule.

**Designated dispersed sites** – Sites where vehicles may pull off local roads but may not access the entire unit for motorized dispersed activities because of the use of fences and/or barriers.

**Desired conditions** – Statements of the social, economic, and ecological outcomes to be achieved in the future. These outcomes relate to land and resource conditions and ecological and social processes. They are aspirations and strategic in nature, rather than project-specific commitments. Some desired conditions may be achieved within the 15-year life of the plan, and others may extend beyond that timeframe. Desired conditions strive to paint a picture of the future Grasslands so that every reader, be they manager or user, understands the same message. Desired conditions form the principal basis from which objectives are developed. Desired conditions

ultimately serve to guide Grassland managers in planning and providing direction for future actions and in developing a meaningful monitoring program to determine progress toward achievement over the life of the plan.

**Desired landscape character** – "The most complete, attractive and sustainable expression of the valued landscape character which is compatible with that landscape's fully integrated set of desired conditions" (SMS Handbook definition page 5-5 expanded). Desired landscape character represents the most "ideal" and attractive scenic identity that is possible, given the limitations of the ecosystem and achievement of other resource objectives as defined in the desired conditions.

**Developed recreation** – Recreation that occurs at manmade developments such as campgrounds, picnic grounds, resorts, ski areas, or trailheads. Facilities might include roads, parking lots, picnic tables, toilets, drinking water, ski lifts, and buildings. Campgrounds and picnic areas are examples of developed recreation sites.

**Developed recreation site** – A distinctly defined area where facilities are provided for concentrated public use, e.g. campgrounds, picnic areas, or swimming areas.

**Dispersed camping** – Camping outside of a developed camping facility.

**Dispersed recreation** – That type of outdoor recreation that tends to be spread out over the land and in conjunction with roads, trails, and undeveloped waterways. Activities are often day-use oriented and include hunting, fishing, boating, hiking, off-road vehicle use, cross-country skiing, motorbiking, and mountain climbing.

**Ditching** – Constructing a roadside ditch to carry surface runoff from the road surface away from the road.

**Dormant season grazing** – Removal of plant material by ungulates when no physiological plant activity is occurring.

**Dry swale** – A low-lying depression between slopes that provides for drainage during storm events.

**Dry wash** – The dry bed of an intermittent stream, such as those found at the bottom of a canyon.

**Dust Bowl** – A historic drought which affected the southern Great Plains, primarily from 1931 to 1939. The drought was characterized by large clouds of moving dust and coincided with the Great Depression.

**Easement** – The right-of-use over the property of another. The land having the right-of-use is known as the dominant estate and the land that is subject to the easement is known as the servient estate.

**Ecosystem** – The system formed by the interaction of a group of organisms and their environment.

**Ecotone** – A transition zone between two distinct ecological communities.

**Eco-tourism** – Environmentally responsible travel to natural areas, in order to enjoy and appreciate nature (and accompanying cultural features, both past and present) that promote

conservation, have a low visitor impact, and provide for beneficially active socioeconomic involvement of local peoples (World Conservation Union).

**Eligible scenic river** – A river that meets the eligibility criteria for a scenic river but has not been evaluated for its suitability. Such rivers are managed to maintain the outstandingly remarkable values for which they were determined to be eligible until a suitability evaluation is completed.

**Emergent** – Aquatic plants with some or most of the leaf area extending out of the water.

**Employment rate** – The proportion of the civilian noninstitutional population aged 16 years and over that is employed; also known as the employment-population ratio (U.S. Bureau of Labor Statistics 2010).

**Endemic** – Native or confined to a certain region; having a comparatively restricted distribution.

**Erosion** – The wearing away of the land's surface by running water, wind, ice, or other geological agents. It includes detachment and movement of soil or rock fragments by water, wind, ice, or gravity.

**Escape structure** – A structure built out of small buried culverts open at both ends, primarily sized for swift fox, which provides shelter to escape from predators.

**Exclosure** – a fence used to keep certain animals from grazing and browsing in a given area, usually to exclude cattle or big game species.

**Facility** – Structures needed to support the management, protection, and use of the national forests, including roads, trails, buildings, utility systems, dams, and other construction features. There are three types of facilities: recreation, administrative, and permittee.

**Federally listed species** – A species listed under the provisions of the Endangered Species Act.

**Flight path** –In this plan, flight path refers to the low-flying areas around an airport where the effects of an aircraft taking off or landing can be expected.

**Flooding regime** – The timing, spatial extent, depth, and response to runoff associated with the overflowing of water from the normal confines of a stream or other body of water.

**Flood plain** – That portion of a river or stream valley, adjacent to the channel, which is covered with water when the river or stream overflows its banks at flood stages.

**Fluvial processes** – The mechanisms which occur when running water causes erosion, transport, and deposition.

**Food plot** – An area sown or planted annually with grains, legumes, berries, or other plants to provide food for wildlife or openings that are mowed or otherwise cultivated to maintain natural herbaceous vegetation.

**Forage** – browse and herbage which is available and can provide food for animals or be harvested for feeding.

**Forb** – Any herbaceous broad-leaved plant species.

**Foreground** – Detailed landscape generally found from the observer to ½ mile away.

**Forest (wood) products** – Any resource derived from trees except lumber. This includes seeds, nuts, firewood, biomass, and other related products.

**Forest Service Handbook (FSH)** – The principal source of specialized guidance and instruction for carrying out the direction issued in the FSM. Specialists and technicians are the primary audience of handbook direction. Handbooks may also incorporate external directives with related USDA and Forest Service directive supplements.

**Forest Service Manual (FSM)** – A general guide containing legal authorities, objectives, policies, responsibilities, instructions, and guidance needed on a continuing basis by Forest Service line officers and primary staff in more than one unit to plan and execute assigned programs and activities.

**Fragmentation** – Habitat fragmentation is a process that occurs wherever a large, contiguous habitat is transformed into smaller patches that are isolated from each other by a landscape matrix unlike the original. This matrix can differ from the original habitat in either composition or structure. The crucial point is that it functions as either a partial or total barrier to dispersal for species associated with the original habitat. A clear threat to population viability exists when the process of fragmentation occurs that isolates pairs and populations versus fragmentation within the home range of the individual pairs.

**Free flowing** – Defined by the Wild and Scenic River Act as, "existing or flowing in natural condition without impoundment, diversion, straightening, rip-rapping, or other modification of the waterway. The existence, however, of low dams, diversion works, and other minor structures at the time any river is proposed for inclusion in the national wild and scenic rivers system shall not automatically bar its consideration for such inclusion."

**Geomorphology** – The classification, description, nature, origin, and development of present landforms and their relationships to underlying structures; and of the history of geologic changes as recorded by these surface features.

**Grazing** – Consumption of range or pasture herbaceous forage by animals.

**Grazing permit** – Any document authorizing livestock to use NFS or other lands under Forest Service control for the purpose of livestock production. CFR 222.1(a) (5)

**Grazing permittee** – An individual who has been granted written permission to graze livestock for a specific period on a range allotment; the recipient of a grazing permit.

**Great Plains** – The large grassland in the rain shadow of the Rocky Mountains, about 2,500 miles from north to south and 600 miles wide from east to west. In the United States, it covers the eastern portions of Montana, Wyoming, Colorado and New Mexico, the western portions of North Dakota, South Dakota, Nebraska, Kansas, and Oklahoma, and the panhandle of Texas. It extends north into the Canadian provinces of Alberta, Saskatchewan, and Manitoba.

**Greenhorn** – Mineral consisting predominantly of dark-colored, chalky limestone and calcareous shale.

**Groundwater** – Water within the earth that supplies wells and springs. Specifically, water in the zone of saturation where all openings in soils and rocks are filled. The upper surface level forms the water table.

**Ground cover** – Anything which covers the ground surface or topsoil and has the effect of reducing erosion. Preferably, this would be a vegetative layer of grasses and/or other low growing plants but may also include plant residues such as leaf litter and tree debris as well as various forms of rock.

**Ground-disturbing activities** – Any activity which moves soil to the extent that an archaeological site may be impacted.

**Groundwater depletion** – Groundwater depletion occurs when aquifer discharge exceeds recharge.

**Groundwater discharge** – Discharge areas are the opposite of recharge areas. They are the locations at which groundwater leaves the aquifer and flows to the surface. Groundwater discharge occurs where the water table intersects the land surface. Where this happens, springs or seeps are found.

**Groundwater recharge** – Recharge is the process by which groundwater is replenished. A recharge area is where water from precipitation percolates downward to an aquifer. Recharge is promoted by vegetation cover, flat topography, permeable soils, a deep water table, and the absence of impermeable substrate.

**Group site** – A recreation site designed to accommodate group events such as family gatherings.

**Growing season** – The period when plants actively photosynthesize and put on vegetative growth in preparation for seed production.

**Guidelines** – Specifications that (1) contribute to maintaining or achieving desired conditions and objectives and (2) would be adopted by a project or activity unless there is a compelling and defensible reason to vary from the guidelines. Such variances are only allowed without plan amendment if the alternative approach provided by the variance meets the intent of the plan guideline. If such a variance is considered appropriate, the responsible official records in the project-level document the reasons for that variance and no plan amendment is required. A project or activity should be consistent with guidelines.

**Gully erosion** – Gully erosion is the process by which gullies are formed. Hillsides are more prone to gullying when they are cleared of vegetation through deforestation, overgrazing, or other means. The eroded soil is easily carried by flowing water after being dislodged from the ground, normally when rain falls during short, intense storms such as during thunderstorms.

**Habitat** – The natural conditions and environment in which a plant or animal lives, e.g. forest, desert, or wetlands.

**Habitat niche** – The locality where the organism may generally be found and where all essentials for its development and existence are present. Habitat niches are described by their geographical boundaries or with such terms as “shady woodlands,” “banks of streams,” “dry hillsides,” etc.

**Headcut** – A sudden change in elevation or knickpoint at the leading edge of a gully. Headcuts can range from less than an inch to several feet in height, depending on several factors. The formation and movement of a gully headcut are often the dominant forms of damage observed in an earth spillway.

**Herbaceous plant** – Plants that have nonwoody stems and die back at the end of the growing season.

**Herbivory** – The consumption of herbaceous vegetation by animals.

**Heritage resources** – Buildings, sites, areas, architecture, memorials, and objects having scientific, prehistoric, historic, or social values.

**High-clearance vehicle** – A vehicle greater than 60 inches in width designed or modified for use "off road" with appropriate clearance, tires, suspension, and undercarriage protection.

**High Plains** – The High Plains are a subregion of the Great Plains in the central United States, generally encompassing the western part of the Great Plains before the region reaches the Rocky Mountains. The High Plains are located in eastern Colorado, western Kansas, western Nebraska, central and eastern Montana, eastern New Mexico, western Oklahoma, northwestern Texas, and southeastern Wyoming. From east to west, the High Plains rise in elevation from around 750 m (2,500 feet) to over 1,800 m (6,000 feet).

**Historical extent** – The geographic area that a vegetation type covered in the past.

**Homestead** – Land claimed by a settler, particularly under the Homestead Act of 1862.

**Hydric soil** – A soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper horizon. Hydric soils along with hydrophytic vegetation and wetland hydrology are used to define wetlands.

**Hydrologic function** – Hydrologic functions are those related to the quantity of water that enters, is stored in, or leaves a wetland. These functions include such factors as the reduction of flow velocity, the role of wetlands as groundwater recharge or discharge areas, and the influence of wetlands on atmospheric processes. Water quality functions include the trapping of sediment, pollution control, and the biochemical processes that take place as water enters, is stored in, or leaves a wetland.

**Hydrology** – The study of the behavior of water in the atmosphere, on the earth's surface, and underground.

**Hydrophytic plant** – A plant characterized by its adaptations to a water-saturated environment.

**Important bird area (IBA)** – Sites that provide essential habitat for one or more species of birds. IBAs include sites for breeding, wintering, and/or migrating birds. IBAs may be a few acres or thousands of acres, but usually they are discrete sites that stand out from the surrounding landscape. IBAs may include public or private lands, or both, and they may be protected or unprotected. The criteria for and selection of IBAs is administered by the Audubon Society.

**Improvement** – Manmade developments, such as roads, trails, fences, stock tanks, pipelines, power and telephone lines, survey monuments, and ditches.

**Inclusion** – A variance in vegetation within a vegetation type due to landform, moisture regime, soil type, erosion, or past disturbance.

**Income** – When "income" is used in this document, it is equivalent to the Bureau of Economic Analysis' definition of personal income which states, "Personal income is the income received by persons from participation in production, plus transfer receipts from government and business, plus government interest (which is treated like a transfer receipt). It is defined as the sum of wage and salary disbursements, supplements to wages and salaries, proprietors' income with inventory valuation and capital consumption adjustments, rental income of persons with capital consumption adjustment, personal dividend income, personal interest income, and personal current transfer receipts, less contributions for government social insurance."

**Indicator species** – A species whose presence, absence, or relative well-being in a given environment is indicative of the health of its ecosystem as a whole.

**Infiltration** – Infiltration is the process of water entering the soil. The rate of infiltration is the maximum velocity at which water enters the soil surface.

**Infrastructure** – The facilities, utilities, and transportation system needed to meet public and administrative needs.

**Intermittent/ephemeral stream** – An ephemeral stream or stretch of a stream is one that flows only in direct response to precipitation or intermittent springs. It receives no water from perennial springs and no long continued supply from melting snow or other source. Its stream channel is at all times above the water table. The term may be arbitrarily restricted to streams or stretches of streams that do not flow continuously during periods of as much as 1 month.

**Interpretive services** – Information services designed to present inspirational, educational, and recreational values to forest visitors to provide the utmost in understanding, appreciation, and enjoyment from their forest experience.

**Invasive species** – A species, including its seed, spores or other biological material, whose introduction does cause or is likely to cause economic or environmental harm or harm to human health (Executive Order 13112).

**Inventoried roadless area** – Areas, typically of 5,000 acres or greater, which were identified in the Roadless Area Review and Evaluation in 1979.

**Isolated parcel** – A parcel of land that is typically the size of a section or less and which is discontinuous to the rest of the NFS lands that are within the administrative boundary of the unit.

**Job growth** – The number of jobs gained by an area over a period of time. Jobs are counted in the same way the Bureau of Economic Analysis counts employment: "a count of jobs, full-time plus part-time, by place of work. Full-time and part-time jobs are given equal weight. Employees, sole proprietors, and general partners are included, but unpaid family workers and volunteers are not."

**Lake-based recreation complexes** – A recreation facility that is located near or adjacent to a lake or reservoir and supports access to and protection of the recreational opportunities of the lake.

**Land adjustment** – Lands acquired through purchase, donation, exchange, transfer, sale, grant, or selection.

**Land exchange** – The conveyance of non-Federal land or interest in the land to the United States in exchange for NFS land or interest in the land.

**Land purchase** – The conveyance of non-Federal land or interest in the land to the United States by fee-simple purchase.

**Large woody debris** – Dead wood left on the ground, including logs, stumps, and limbs contributes to the structural diversity of the forest and biotic diversity of the ecosystem by hosting fungi, insects, invertebrates, small mammals, and birds. They also have a critical role in the larger forest because of their importance to nutrient cycling.

**Leasing (oil and gas)** – A contract right granted by the United States allowing a lessee the right of holding a record title and operating right to the leased oil and/or gas in exchange for rent and royalty payments. Oil and gas leases will expire in 10 years if they are not put into production; otherwise, leases do not expire as long as they are "held by production."

**Litter** – The uppermost layer of organic debris on the ground, composed mainly of fresh or slightly decomposed leaves, bark, twigs, flowers, fruits, and other vegetative matter.

**Management approach** – Approach or strategy to manage the unit to achieve a desired condition. Management approaches often convey how plan components work together to achieve the desired condition. They may also describe context, intent, priorities, collaborations, needs for surveys, inventories or assessments, or approaches to risk and uncertainty. They are not, however, plan components.

**Management indicator species** – Plant or animal species or habitat components selected during the alternatives analyses stage of an environmental impact statement that are used to monitor the effects of planned management activities on populations of wildlife and fish, including those that are socially or economically important.

**Mast** – The flowers, fruits, or seeds of plants, especially of trees and shrubs that are eaten by animals. Hard mast includes hard-shelled seeds such as acorns and hickory nuts. Soft mast includes flowers and seeds with a fleshy cover (for example berries, wild cherries, and maple seeds).

**Memorandum of understanding (MOU)** – A legal agreement between the Forest Service and other agencies resulting from consultation between agencies that states specific measures the agencies will follow to accomplish a large or complex project. A MOU is not a fund obligating document.

**Mesic (adapted) species** – Plant species adapted to mesic environmental conditions are ones with medium moisture requirements. Mesic soil is a medium type of soil that drains well, yet retains some water.

**Middle ground** – The zone between the foreground and background in a landscape. The area located from ½ mile to 4 miles from the observer.

**Minerals, common variety** – see "Common mineral."

**Monitoring** – Collecting information to track system conditions and their response to management.

**Motor vehicle use map** – A map displaying designated roads, trails, and areas for motor vehicle use on an administrative unit or a ranger district of the NFS.

**Mott** – A small group of trees usually in grassland or shrub land setting.

**National Environmental Policy Act (NEPA)** – An act declaring a national policy to encourage productive and enjoyable harmony between man and his environment, to promote efforts which will prevent or eliminate damage to the environment and the biosphere and stimulate the health and welfare of man, to enrich the understanding of the ecological systems and natural resources important to the Nation and to establish a Council on Environmental Quality.

**National forest land and resource management plan** – A plan developed to meet the requirements of the Forest and Rangeland Renewable Resources Planning Act of 1974, as amended, that guides all resource management activities and establishes management standards and guidelines for the NFS lands of a given NF.

**National Forest System (NFS) land** – Federal lands that have been designated by Executive Order or statute as national forest, national grasslands, or purchase units, or other lands under the administration of the Forest Service.

**National historic trail** – National historic trails were authorized under the National Trails System Act of 1968 (Public Law 90-543), along with national scenic trails and national recreation trails. National scenic trails and national historic trails may only be designated by an act of Congress.

**National Register of Historic Places** – A list of heritage resources that have local, state, or national significance maintained by the Secretary of the Interior.

**National Wild and Scenic River System** – Rivers with outstanding scenic, recreational, geological, fish and wildlife, historic, cultural, or other similar values; designated by Congress under the Wild and Scenic Rivers Act for preservation of their free flowing condition.

**National Wilderness Preservation System** – Pristine Federal lands designated by the Wilderness Act of 1964 and subsequent wilderness legislation. Generally, these lands are untouched by "works of man."

**Natural recruitment** – The unaided settlement and proliferation of a species in a suitable habitat.

**Nesting platform** – An artificial nest structure employed as a habitat improvement practice when quality nest sites are a limiting factor to raptor density.

**Nongovernmental organization (NGO)** – is a term that has become widely accepted as referring to a legally constituted entity created by natural or legal persons with no participation or representation of any government. NGOs exist for a variety of reasons, usually to further the political or social goals of their members or funders. Examples include improving the state of the natural environment, encouraging the observance of human rights, improving the welfare of the disadvantaged, or representing a corporate agenda.

**No surface occupancy** – A fluid mineral leasing stipulation that prohibits occupancy or disturbance on all or part of the land surface to protect special values or uses. The NSO stipulation includes stipulations that may have been worded as "no surface use/occupancy," "no surface disturbance," "conditional NSO," and "surface disturbance or surface occupancy

restriction by location." Lessee may exploit the oil and gas or geothermal resources under leases restricted by this stipulation through use of directional drilling from sites outside the NSO area.

**Nonsalary income** – Income from employment that does not pay a wage or salary, such as a small business or farm.

**No wake boating** – The slowest speed at which it is still possible to maintain steering and which does not produce a wake.

**Noxious weed** – A legal term applied to plants regulated by Federal and state laws, such as plants designated as noxious weeds by the Secretary of Agriculture or by the responsible state official. Noxious weeds generally possess one or more of the following characteristics: aggressive and difficult to manage, poisonous, toxic, parasitic, a carrier or host of serious insect or disease, and being not native or new or not common to the United States or parts thereof. (Forest Service Manual 2080.5, Federal Noxious Weed Act of 1974, PL 93-629, as amended).

**Objectives** – Proactive steps that the Grasslands expect to accomplish over the next 15 years to maintain or move toward the desired conditions of the plan. Objectives are measurable and time-specific outcomes. Any project or activity undertaken during the life of the plan must be consistent with objectives. Variations in achieving objectives may take place during the next 15 years because of changes in environmental conditions, available budgets, catastrophic events, and other unforeseen factors.

**Off-highway vehicle** – Any motorized vehicle capable of or designed for travel on or immediately over land, water, or other natural terrain with a vehicle width of less than 50 inches.

**Off-road motorized vehicle** – Any motorized vehicle capable of or designed for travel on or immediately over land, water, or other natural terrain. This includes all mechanical means of transportation: passenger cars, 4-wheel drive pickups or sport utility vehicles, trail bikes, snowmobiles, or other ground transportation vehicles that are capable of traveling over land where no roads exist.

**Open pit** – A shallow, manmade open pond or pit used on a drill site or production pad to hold produced water or fluids from drilling. "Closed" pits refer to the use of tanks to store these types of fluids.

**Outdoor classrooms** – Areas that are designed and managed for use by local schools and other educational institutions.

**Outsloping** – Shaping the road surface with a continuous cross slope to carry surface water off the fill side of the road.

**Outstandingly remarkable values** – Scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values which make a river eligible for designation as a wild or scenic river.

**Overland flow** – A condition in which precipitation rate is faster than infiltration rate, and excess water runs over the surface of the land.

**Overlay** – A management area or special area that provides more specific direction for a small geographic location within a larger management area. The management direction given for the

larger management area continues to apply. For example, if proposing a project next to the Canadian River, a specialist would have to look at the direction for the eligible scenic river and the Mills Canyon Management Area, which are both overlays, as well as the direction for the KRB Management Area.

**Overstory** – That portion of a plant community consisting of the taller plants on the site; the forest or woodland canopy.

**Paleontological resources** – Fossils and other resources related to the natural history of an area.

**Palustrine wetland** – Relating to a system of inland, nontidal wetlands characterized by the presence of trees, shrubs, and emergent vegetation (vegetation that is rooted below water but grows above the surface). Palustrine wetlands range from permanently saturated or flooded land (as in marshes, swamps, and lakeshores) to land that is wet only seasonally (as in vernal pools). See "Emergent."

**Pasture** – A grazing area enclosed and separated from other areas by fencing or other barriers.

**Patch (size)** – A relatively homogeneous nonlinear area that differs from its surroundings. It can specifically describe forested patches, nonforest vegetation patches, rock/barren patches, or water patches.

**Per capita income** – This measure of income is calculated as the total personal income of the residents of an area divided by the population of the area. Per capita personal income is often used as an indicator of consumers' purchasing power and of the economic well-being of the residents of an area.

**Perennial stream** – Permanently inundated surface stream course. Surface water flows throughout the year except in years of prolonged drought.

**Playa lakes** – Bowl-shaped depressions that are dependent on rainfall and surface runoff for the water they impound. They are closed basins and usually do not overflow. They are mostly intermittent, with lake evaporation occurring at about 60 inches per year.

**Potential natural vegetation type** – The plant community that would become established if all successional sequences were completed without human interference under present environmental and floristic conditions, including those created by man.

**Potential wilderness area** – An area that meets the criteria for the inventory phase of wilderness evaluation as described in FSH 1909.12 Chapter 71.

**Prescribed burn** – Fire burning under conditions specified in an approved plan to dispose of fuels, control unwanted vegetation, stimulate growth of desired vegetation, change successional stages, etc., to meet range, wildlife, recreation, wilderness, watershed, or timber management objectives. Prescribed burns occur under specified environmental conditions that allow the fire to safely be confined to a predetermined area and produce the fireline intensity and rate of spread required to meet management objectives.

**Quality of life** – A term used to refer to the social, economic, and health related values that compose the overall satisfaction and general well-being of an individual or community.

**Recreation Opportunity Spectrum (ROS)** – A framework for stratifying and defining classes of outdoor recreation environments, activities, and experience opportunities. The settings, activities, and opportunities for obtaining experiences have been arranged along a continuum or spectrum divided into six classes: primitive, semiprimitive nonmotorized, semiprimitive motorized, roaded natural, rural, and urban.

**Recreation settings** – The combination of physical, biological, social, and managerial conditions that give value to a place for recreation opportunities.

**Recreational fisheries** – A water body that supports fish which are managed for sport fishing.

**Reference condition** – The environmental conditions that imply ecological sustainability, represented by the characteristic range of variation (when available), not the total range of variation, prior to European settlement and under the current climatic period. At landscape scales, presettlement human-caused effects are inherent to the reference condition, particularly where there are fire-adapted systems. It may be necessary to refine reference conditions according to climate change projections and permanent environmental changes (e.g., invasive species). Reference conditions are best suited for analysis when quantified by amount, condition, spatial distribution, and temporal variation.

**Research** – Activities undertaken for the purpose of formal scientific inquiry by the Forest Service, other Federal agencies, universities, or an individual researcher.

**Research Natural Area (RNA)** – An area set aside by the Forest Service to preserve a representative sample of an ecological community, primarily for scientific and educational purposes. Commercial exploitation is not allowed and general public use is discouraged.

**Research site** – A site that is limited in its ability to be used for other management purposes and is part of an active research project.

**Residual ground cover** – Plant material remaining onsite after grazing activity has ended.

**Right-of-way** – A linear strip of land defined for a present or future location of transportation or utility right-of-way within its boundaries.

**Riparian** – An area of vegetation adjacent to an aquatic ecosystem distinguished by a high water table, certain soil characteristics, and some vegetation that requires free water or moist soil conditions.

**Riverine** – Relating to a system of inland wetlands and deep water habitats, characterized by the absence of trees, shrubs, or emergent vegetations associated within a channel which periodically or continuously contains nontidal flowing water.

**Road** – A motor vehicle route over 50 inches wide, unless identified and managed as a trail (36 CFR 212.1, FSM 7705).

**Road abandonment** – A method of road decommissioning whereby the road receives no physical treatment.

**Road decommissioning** – Activities that result in the stabilization and restoration of unneeded roads to a more natural state (36 CFR 212.1).

**Road management objectives** – RMOs document the intended purpose of an individual road in providing access to implement a land and resource management plan as well as decisions about applicable standards for the road. RMOs should be based on management area direction and access management objectives. RMOs contain design criteria, operation criteria, and maintenance criteria (FSM 7709.59.11).

**Roaded natural ROS** – Characterized by a predominantly natural appearing environment with moderate evidence of human activity. Resource modification and utilization practices are evident but harmonize with the natural environment. May have a mosaic of highly modified areas to pockets of unmodified lands. Developed sites provide for some user comfort as well as site protection, but harmonize with the natural environment.

**Roadway** – Portion of the road that includes everything from the top of the cut slope to the bottom of the fill slope.

**Rolling dips** – Shallow depressions built diagonally across a road to divert surface water runoff from the road.

**Roost** – A support such as tree limbs, thick tree bark, or brush piles which birds or bats use to rest upon or use for cover.

**Rural ROS** – A substantially modified natural environment. There is evidence of resource modification and utilization practices, and facilities are often designed for larger numbers of people. Campgrounds often include paved roads, electricity, and other conveniences.

**RV** – Abbreviation for recreational vehicle, which is a vehicle that contains living quarters for recreational purposes.

**Salting/mineral supplementation/supplemental feeding** – Providing necessary nutrients that are not naturally provided to grazing animals.

**Savanna** – A grassy plain typified by the presence of a low density of open-grown trees and which is usually maintained by periodic fire.

**Scenery** – General appearance of a place, landscape, and/or its visible features (definition per SMS Handbook glossary, slightly revised and shortened for clarity).

**Scenery Management System (SMS)** – A process for the inventory and analysis of the aesthetic values of national forest lands providing for integration of these values with other biological, physical, and social/cultural resources in the planning process.

**Scenery objectives** – Also known as scenic integrity objectives, which set guidelines to manage the degree that management or other projects may negatively impact the desired landscape character, according to Agriculture Handbook 701, Landscape Aesthetics: A Handbook for Scenery Management.

**Scenic** – Of or relating to landscape scenery; pertaining to natural, natural appearing or other valued scenery; constituting or affording pleasant views of natural landscape attributes or positive cultural elements (definition per SMS Handbook glossary, slightly revised for clarity).

**Scenic integrity (high, medium and low)** – A measure of the degree to which a landscape is visually perceived to be "complete," and is determined by three factors: dominance, degree of deviation, and intactness of the desired landscape character established based on the existing condition. Scenic integrity disturbances most typically result from human activities, but can also result from natural events which exceed the landscape's historic range of variability in terms of magnitude, duration, or intensity. An exception to this is direct human alterations that have become accepted over time as positive landscape character attributes (e.g., historic cabins, farms, and ranches).

**High integrity** – The valued scenery "appears natural or unaltered," yet visual disturbances are present; however, they remain unnoticed because they repeat the form, line, color, texture, pattern, and scale of the valued scenery. When used as a standard or guideline, this level should be achieved as soon after project completion as possible or within 3 years, maximum.

**Moderate integrity** – The valued scenery "appears slightly altered." Noticeable disturbances are minor and visually subordinate to the valued scenery because they repeat its form, line, color, texture, pattern, and scale. When used as a standard or guideline, this level should be achieved as soon after project completion as possible or within 3 years, maximum.

**Low integrity** – The valued scenery "appears moderately altered." Visual disturbances are codominant with the valued scenery and may create a focal point of moderate contrast. Disturbances may reflect, introduce, or "borrow" valued scenery attributes from outside the landscape being viewed (such as the size, shape, edge effect, and pattern of natural openings; vegetative type changes or socially valued architectural styles). Scenery attributes borrowed from outside the viewed landscape appear compatible with or complementary to those within. When used as a standard or guideline, this level should be achieved as soon after project completion as possible or within 3 years, maximum.

**Scenic quality** – Degree to which the appearance of a place, landscape, or feature can elicit psychological and physiological benefits to individuals and, therefore, to society in general (definition per SMS Handbook glossary, revised). Scenic quality is described and measured through the landscape character inventory information and the cumulative conditions of the two primary SMS indicators described in this glossary, "Scenic integrity" and "Scenic stability."

**Scenic river** – Those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.

**Seasonal depressional wetland** – See "Depressional wetland."

**Sediment** – Solid material, both mineral and organic, that is in suspension, is being transported, or has been moved from its site of origin by air, water, gravity, or ice and has come to rest on the earth's surface either above or below sea level.

**Sediment load** – Solid material, both mineral and organic, that is in suspension, being transported, or has been moved from site of origin by air, water, gravity, or ice.

**Sedimentation** – The deposition or settling of soil particles suspended in water.

**Semiprimitive motorized ROS** – Similar setting to the SPNM below, except this area provides a motorized back-country experience where trails and primitive roads are designed for high-clearance, four-wheel-drive vehicles. There is a moderate probability of experiencing solitude.

High degree of self-reliance and challenge in using motorized equipment. These areas are predominantly natural, lacking some human modification, except when necessary for site protection.

**Semiprimitive nonmotorized (SPNM) ROS** – A nonmotorized back-country area with a predominantly natural appearing environment, without evidence of resource modification and utilization practices. This type of area provides opportunities for self-reliance and challenge, with a low concentration of users and high degree of interaction with the natural environment. Recreation developments are rustic and rudimentary and primarily provided for the protection of the resources rather than convenience of the users.

**Shelterbelt** – A shelterbelt is a windbreak plantation made up of one or more rows of trees or shrubs planted in such a manner as to provide shelter from the wind and to protect soil from erosion. The Great Plains Shelterbelt was a project used to create windbreaks in the Great Plains states that was launched in 1934. President Franklin D. Roosevelt initiated the project in response to the severe dust storms of the Dust Bowl which resulted in significant soil erosion and drought. The Great Plains Shelterbelt was authorized under the 1924 Clarke-McNary Act and was carried out by the Works Projects Administration (WPA). By 1942, 30,233 shelterbelts had been planted, which contained 220 million trees and stretched for 18,600 miles (29,900 km).

**Snag** – A standing, dead tree from which the leaves and most of the branches have fallen.

**Soil compaction** – Soil compaction occurs when soil particles are pressed together, reducing the pore space between them. This increases the weight of solids per unit volume of soil (bulk density). Soil compaction occurs in response to pressure (weight per unit area) exerted by field machinery or animals. The risk for compaction is greatest when soils are wet.

**Soil fertility** – Soil fertility deals with the nutrient status, or ability of soil to supply nutrients for plant growth under favorable environmental conditions such as light and temperature, and the physical conditions of the soil.

**Soil productivity** – The capacity of a soil to support the growth of specified plants, plant communities, or a sequence of plant communities. Soil productivity may be expressed in terms of volume or weight per unit, area per year, percent plant cover, or other measures of biomass accumulation.

**Special areas** – Certain limited areas of NFS lands not designated as wilderness and containing outstanding examples of plant and animal communities, geological features, scenic grandeur, or other special attributes that merit special management. These areas are designated by law or may be designated administratively as special areas. Areas so designated are managed to emphasize recreational and other specific related values. Other uses are permitted in the areas to the extent that these uses are in harmony with the purpose for which the area was designated. The law or order designating each area provides specific objectives and guidelines for management of each area.

**Special use** – Those uses and occupancy occurring on more than a transient basis except those covered by mining laws or associated with harvesting timber or grazing livestock. These uses include roads, all types of utilities, ski areas, cemeteries, electronic sites, and recreation residences. Uses are ordinarily covered by either an annual or term permit. Annual permits are for relatively short-term use and are revocable by the Forest Service. They are renewable each year

by payment of a fee. Term permits are used to cover uses of a longer time period (up to 30 years) and having a large economic investment. Examples of this permit include large electric transmission lines and large recreation resorts and ski areas.

**Species abundance** – Relative species abundance and species richness describe key elements of biodiversity. Relative species abundance refers to how common or rare a species is relative to other species in a given location or community.

**Species composition** – The proportions of various individual plant species in relation to the total in a given area.

**Species diversity** – The number of different species in a particular area (species richness) weighted by some measure of abundance such as number of individuals or biomass.

**Species richness** – Species richness is the number of species present in a sample, community, or taxonomic group. Species richness is one component of the concept of species diversity.

**Species structure** – The physical height of a plant species in a vegetation community.

**Species viability** – Capability to possess the necessary population size and distribution of reproductive individuals for the well-distributed, continued existence in the planning area.

**Spreader dam** – A structure designed to dissipate surface flow.

**Stand** – A group of trees sufficiently uniform in species composition, size, age, structure, spatial arrangement, and condition to be distinguished from surrounding stands and managed as a single unit.

**Standard** – An absolute requirement to be met in the design of projects and activities. A project or activity is consistent with a standard when its design is in accord with the explicit provisions of the standard; variance from a standard in any way is not allowed. In sum, a project or activity should meet the spirit, if not the letter, of a guideline, but must meet the letter of a standard.

**Streambank** – The sides of a channel that hold or carry water.

**Structure** – The presence, size, and physical arrangement of vegetation in a stand. Vertical structure refers to the variety of plant heights, from the canopy to the forest floor. Horizontal structure refers to the types, sizes, and distribution of trees and other plants across the land surface. Forest lands with substantial structural diversity provide a variety of niches for different wildlife species.

**Successional stage** – A stage of development of a plant community as it moves from bare ground to climax.

**Suitability** – The appropriateness of applying certain resource management practices to a particular area of land, as determined by an analysis of the economic and environmental consequences and the alternative uses foregone. A unit of land may be suitable for a variety of individual or combined management practices.

**Surface runoff** – Refers to the loss of water from an area by flow over the land surface.

**Surface use plan of operation (SUPO)** – A plan of operations covering proposed surface-disturbing activities that must be approved by the Forest Service prior to any surface-disturbing activities occurring.

**Sustainability** – Sustainability is a goal for economic development and natural resource management. Ecosystem sustainability is the capacity of an ecosystem for long-term maintenance of ecological processes and functions, biological diversity, and productivity. Social and economic sustainability generally refers to land management practices that provide goods and services from a resource without degradation of the site quality, and without a decline in the yield of goods and services over time.

**Sustained yield** – The achievement and maintenance in perpetuity of an annual or periodic output of the various renewable resources of the NFS without impairment of the productivity of the land.

**Terrace** – A leveled section of a hill cultivated area, designed as a method of soil conservation to slow or prevent rapid surface runoff.

**Terrestrial ecosystem survey (TES)** and **terrestrial ecological unit inventory (TEUI)** – A classification of ecological types and mapped terrestrial ecological units using a consistent standard throughout NFS lands. Ecological units are categorized to identify land and water areas at different levels of resolution based upon similar capabilities and potentials for response to management and natural disturbances. Capabilities and potentials derive from multiple elements, such as climate, geomorphology, geology, soils, water, and potential vegetation.

**Topsoil** – The upper, outermost layer of soil, usually the top 2 inches (5.1 cm) to 8 inches (20 cm). It has the highest concentration of organic matter and microorganisms and is where most of the earth's biological soil activity occurs.

**Trail** – A route 50 inches or less in width or a route over 50 inches wide that is identified and managed as a trail (36 CFR 212.1).

**Travel Management Rule** – Located in 36 CFR 212, Subpart B, Designation of Roads, Trails, and Areas for Motor Vehicle Use. The rule requires each national forest or ranger district to designate those roads, trails, and areas open to motor vehicles. Designation will include class of vehicle and, if appropriate, time of year for motor vehicle use. A given route, for example, could be designated for use by motorcycles, ATVs, or street legal vehicles. Once designation is complete, the rule will prohibit motor vehicle use off the designated system or inconsistent with the designations. Designations will be shown on a motor vehicle use map. Use inconsistent with the designations will be prohibited.

**Tree guard (crib)** – A structure placed around trees for protection against cattle rubbing and root trampling.

**Understory** – Plants growing beneath the canopy of other plants. Usually refers to grasses, forbs, and low shrubs under a tree or shrub canopy.

**Ungulate** – A hoofed mammal, such as deer, elk, mountain goats, bighorn sheep, moose, antelope, caribou, and bison. Grazing animal that has hooves (e.g. cattle, antelope).

**Urban cluster** – The Census Bureau delineates urban cluster boundaries to encompass densely settled territory, which consists of core census block groups or blocks that have a population

density of at least 1,000 people per square mile and surrounding census blocks that have an overall density of at least 500 people per square mile. In addition, under certain conditions, less densely settled territory may be part of the urban cluster.

**Utility corridors** – The linear space needed to bury or suspend a produced water line, gas pipeline, oil pipeline, electric, or other line(s). It is often, but not always, located along a road.

**Valued landscape** – Those attributes that make the landscape valuable to people. These attributes may include parts of the built environment.

**Watershed condition** – The state of a watershed based upon physical and biological characteristics affecting hydrologic and soil functions. It is determined through the synthesis of information including vegetation types and condition, streambank conditions, range conditions and trend, soil conditions and erosion potential, and remotely sensed and field observations.

**Wetland** – Habitat that is transitional between terrestrial and aquatic where the water table is usually at or near the land surface, or the land is covered by shallow water. Wetlands have one or more of the following characteristics: (1) at least periodically the land supports predominantly hydrophytic plants; (2) the substrate is predominantly undrained hydric soil; and (3) the substrate is nonsoil and is saturated with water or covered by shallow water at sometime during the growing season of each year (FSM 2600).

**Wilderness area** – An area of undeveloped Federal land that Congress designated as wilderness and that retains its primeval character and influence, is without permanent improvements or human habitation, and is protected and managed to preserve its natural conditions. An area that (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) comprises at least 5,000 acres of land or is of sufficient size to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value (Wilderness Act, 1964).

**Wildlife corridors** – Strips of trees, shrubs, and/or understory vegetation that provide cover and habitat for wildlife and serve as travel lanes for movement between isolated patches of habitat.

**Wildlife habitat improvement** – Establishment of trees, shrubs, grasses, legumes, and/or forbs to increase or improve wildlife habitat. Wildlife water development habitat improvements might include ponds, windmills, solar pumps, and guzzlers designed to benefit wildlife.

**Wind farm** – A large group of wind turbines.

**Wind turbine** – A turbine which transforms the kinetic energy of the wind into mechanical or electrical energy that can be harnessed for practical use.

**Woody plant community** – A group of tree or shrub plant populations.

**Woodland** – A plant community in which trees are often small, characteristically with a greater proportion of their total height being crown more so than clear bole, and having trees spaced far enough apart that the canopies of adjacent trees usually do not touch and with the ground vegetation being mostly herbaceous, commonly grass (USDA Forest Service 2004).

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# Appendix

# A. Response to Comments

A notice of availability was posted in the Federal Register on September 30, 2011, by the U.S. Environmental Protection Agency (EPA) for the draft environmental impact statement (DEIS) titled "Draft Environmental Impact Statement for the Kiowa, Rita Blanca, Black Kettle, and McClellan Creek National Grasslands Land and Resource Management Plan." This began the 90-day comment period, which ended on December 28, 2011. The Forest Service received 1,492 comment letters from individuals, organizations, and agencies; these comments were received by email, Web form, and via the U.S. Post Office. The Forest Service responded in the following three basic ways to the substantive comments, as prescribed in 40 CFR 1503.4:

- Modifying alternatives (the proposed plan (alternative B) and the wilderness alternative (alternative C));
- Developing or analyzing alternatives not given detailed consideration in the DEIS;
- Supplementing, improving, or modifying the analysis that the DEIS documented;
- Making factual corrections; and/or
- Explaining why the comments do not need further Agency response.

After a comprehensive review of the public comments received, the second and third bullets do not apply.

## Content Analysis Process

Content analysis followed a systematic process of logging, numbering, reading, coding, and summarizing all public comments that were submitted. The process ensures that every comment was read, analyzed, and considered. The comments that were most helpful were those that were unique, substantially different, and were specifically related to the analysis disclosed in the EIS and the proposed action. When an individual raised multiple comments within the same letter, each unique comment was numbered and tracked separately. Each comment was assigned a unique tracking number in a database and coded by subject or topic. All comments and their history and status are recorded in the Kiowa, Rita Blanca, Black Kettle, and McClellan Creek National Grasslands Revised Land and Resource Management Plan project number 31418, within the USFS Comment Analysis and Response Application (CARA) database. This database is part of the planning record and can be accessed at the Cibola National Forest Supervisor's Office, 2113 Osuna Rd., NE, Albuquerque, NM. Once the unique comments were coded, those that were made by different commenters on the same subject were grouped and summarized into comment statements that captured the essence of like comments. Each comment statement is accompanied by a single response developed by subject-matter experts. In some cases, more nuanced or complex concerns were answered through multiple responses to multiple comment statements or they may have a single response dedicated to the specific comment. Every comment has the same value, whether expressed by many or by one.

## National Environmental Policy Act (NEPA) Process and Procedures Concerns

**Comment:** Some commenters believe that the DEIS considers an inadequate range of alternatives, or failed to meet requirements of the National Environmental Policy Act (NEPA); that it does not take a "hard look" at the landscape, nor meet the "hard look" charge, or does not meet the requirement of NEPA for site specificity. The commenters maintained that it is not sufficient to change one aspect of one alternative and still meet the requirement of considering all reasonable alternatives. Some encouraged a supplemental EIS or a final EIS with additional alternatives with single resource emphasis on wildlife, water quality, soil productivity, nature-based or ecotourism, species reintroductions (including bison), open spaces, renewable energy, and nonmotorized recreation. Some believed that none of the alternatives contained sufficient standards to safeguard the natural values contained on the Kiowa and Rita Blanca (KRB) and Black Kettle and McClellan Creek (BKMC) National Grasslands (NGs), herein referred to as the "Grasslands."

**Response:** Chapter two of the DEIS describes three alternatives considered in detail and two alternatives considered but eliminated from detailed study. Two action alternatives (alternative B, proposed plan, and alternative C, wilderness alternative) address needs-for-change issues presented in chapter 1 of the DEIS. Also explained in chapter 1 (page 7) of the DEIS, alternatives B and C were further refined using the "rolling alternative" concept and were influenced by public and internal comments received during collaborative, alternatives scoping. Issues arising through scoping that were appropriate to be addressed by a strategic land and resource management plan were resolved either through the rolling alternative concept, through alternative C, or in alternatives considered but not analyzed in detail. This is consistent with the Forest Service NEPA regulations at 36 CFR 220.5(e)(1) stating "The responsible official may modify the proposed action and alternative(s) under consideration prior to issuing a draft EIS. In such cases, the responsible official may consider the incremental changes as alternatives considered. The documentation of these incremental changes to a proposed action or alternatives shall be included or incorporated by reference in accord with 40 CFR 1502.21."

With regard to the comment that the DEIS did not take a hard look at the landscape, the ecological sustainability report (August 2008; part of the Analysis of the Management Situation set of documents) which has been available to the public on the Cibola NF and NGs' Web site since publication in 2008, reported and summarized all known data on the condition of the Grasslands' landscape and its resources. The Agency further believes it took a hard look in the EIS at the impacts of the alternatives considered in detail and is consistent with most court decisions on this matter, most recently, *High Sierra Hikers Association v. U.S. Dept. of Interior* (N.D. Cal. 2012) 2012 U.S. Dist. LEXIS 7664, regarding a programmatic land management plan.

The Agency believes that the programmatic EIS meets the requirements of NEPA for site specificity. In the context of the Grasslands, the analysis was site specific because it applied to specific national grasslands, their ecological settings, and the broader settings in which they play a role. More detailed project-specific or site-specific analyses will be considered by the Agency prior to implementing a project or activity.

The Agency believes that the proposed plan (alternative B) and the wilderness alternative (alternative C) provide substantial management direction for science-based conservation of wildlife, water quality, soil productivity, nature-based tourism, open spaces, renewable energy,

and nonmotorized recreation. Additional alternatives that emphasize management of single resources, goods, or services are not necessary because alternatives B and C provide sufficient flexibility and guidance to accommodate all of those resources, and they are not mutually exclusive. Both alternatives provide plan components (desired conditions, objectives, guidelines or standards, suitability, and monitoring elements) for each of these resources, goods, or services. Forest Service Manual and Forest Service Handbook directives, laws, regulations, and policy provide additional management guidance for these resources, goods, and services, and were identified by topic area in appendix D of the proposed plan. Further, the proposed plan is strategic in nature, and any project-specific activity affecting any of the resources, goods, or services mentioned above would require its own specific NEPA analysis.

Regarding the idea that species reintroductions (including bison) should be a separate alternative, under existing policy, the Agency can administratively consider a request to stock bison on the Grasslands under any DEIS alternative, including the no-action alternative A. Either a permittee or a state wildlife agency could request a permit to run bison on an allotment authorized to them. A project-specific environmental analysis would need to be conducted upon such a request. The Agency does not believe this is an issue appropriate to a strategic plan revision alternative, but rather is an administrative procedure. For species reintroductions in general, plans do not reintroduce species; they provide for habitats that allow for future species introduction decisions. The new plan does not inhibit future reintroduction decisions.

With regard to whether the alternatives contain sufficient standards to safeguard the natural values on the Grasslands, as per the definitions of the various plan components in part one, pages 12-13 of the proposed plan, standards are not the only type of plan component that guides management of the Grasslands. Over the life of the plan, desired conditions, objectives, guidelines, suitability, monitoring elements, and laws, regulations, and policy as identified in appendix D, all contribute to the accomplishment of ecological and socioeconomic sustainability of the resources, goods, and services provided by the Grasslands. Project/site-specific environmental analyses (NEPA) are another important safeguard in conserving the natural values of the Grasslands.

Thus, the Agency believes the DEIS met the range of reasonable alternatives within the sideboards of the identified needs-for-change and does not believe a supplemental EIS or additional alternatives in the FEIS is needed. The Agency believes that it has provided completeness of information and detail, soundness of analysis, thorough discussion of alternatives, and disclosure of sources, and has made a substantial good faith effort at studying, analyzing, and expressing the environmental issues in the EIS. The Agency also believes that the action alternatives in particular, provide sufficient safeguards for the conservation of natural values of the Grasslands.

**Comment:** One group of commenters had concerns about the overall tone and structure of the document, which they believed appears vague and without specifics regarding management policy or enforcement.

**Response:** Part one, “Introduction,” page 2 of the proposed plan (alternative B) discusses the purpose of the land management plan, its strategic nature, and broad guidance for project-specific activity. Enforcement of laws, regulations, and policy upon the public is not a strategic plan purpose. Enforcement of existing laws and regulations is a requirement of the Agency, regardless of the land management plan alternative selected.

Chapter 3, page 129 of the DEIS, under the headings of "Unavoidable Adverse Effects" and "Irreversible and Irretrievable Commitments of Resources," further addresses the programmatic nature of a land management plan. The DEIS is itself programmatic in that it analyzes and compares plan alternatives for management direction and the environmental consequences of those alternatives, but not project-specific effects that could occur under the auspices of a plan alternative. Those specific effects would be identified and evaluated in a project specific environmental analysis.

The Agency believes both the proposed plan and DEIS meet the requirements of the National Forest Management Act and the 1982 Planning Rule provisions.

## Law, Regulation, and Policy

**Comment:** The U.S. Dept. of Transportation, Federal Aviation Administration (FAA) commented that the Agency may need to consider if notice to the FAA is required for the effect of the proposed actions on airspace.

**Response:** The Agency does not believe the proposed plan would have any direct effects on airspace at the strategic plan level. Chapter 3, page 129, discusses the programmatic framework of a land management plan. The agency will give notice to the FAA for any project-specific activity that could affect airspace under the proposed plan.

## General Comments

**Comment:** One commenter stated that the proposed plan should contain measurable objectives and specific monitoring criteria. Another commenter stated he could not find any standards, guidelines, monitoring, and evaluation requirements in the DEIS. The commenter continued that these items should be in chapter 2 of the DEIS, which is supposed to describe the alternatives in a meaningful fashion, or the reader should be pointed to them. The statement was made that the Agency does not reveal the proposed alternative, nor does the Agency disclose the current condition of the landscape and how the proposed plan will affect the conditions of the land.

**Response:** The proposed plan document contains all plan components, including measurable objectives and specific monitoring elements, as required by the 1982 Rule Provisions at Section 219.11. The proposed plan document was made available on the Cibola NF and NGs' Web site on September 22, 2011, concurrent with the availability of the DEIS, and was available during the entire 90-day comment period as required by the 1982 Rule provisions at 219.6g. In addition to press releases notifying of availability of both documents, approximately 700 notification letters and emails were sent to individuals, organizations, and agencies who over the past 5 years had indicated an interest in Grasslands plan revision.

In the DEIS, a programmatic summary of the alternatives was presented, but the entirety of the plan alternatives with each individual plan component was not included nor is required when an alternative source is provided and pointed to. Similarly, the Analysis of Management Situation, comprised of the ecological and socioeconomic sustainability reports and the comprehensive evaluation report, described the current condition of the landscape and has been available for viewing on the Web or hardcopy request since late summer 2008.

Finally, chapter 3 of the DEIS describes the anticipated environmental consequences of each alternative land plan upon the resources, goods, and services of the Grasslands.

**Comment:** A commenter was concerned that appendix H of the draft plan does not describe the validation procedure for grazing capacity benchmarks.

**Response:** The procedure for the validation of grazing capacity is detailed in the Analysis of the Management Situation Supplementary Document cited in the draft EIS and posted on the Cibola National Forest Web page
http://www.fs.usda.gov/goto/Cibola_Grasslands_Plan_Revision_documents

**Comment:** A commenter was concerned that the proposed plan does not provide a framework or measureable objectives for adaptive management.

**Response:** Evaluation of data collected during monitoring forms the basis for adaptively managing public lands within the planning area. Consistent monitoring and evaluation will allow the Grasslands to incorporate new technology, changes in law or policy, and changes in ecological conditions or social values into land management planning. This process accomplishes these goals by verifying the effectiveness of plan objectives and guidelines, and provides reference information for plan amendments.

The monitoring table (table 6 in the draft plan) identifies the social, economic, and ecological elements to be monitored, and it links monitoring questions and measures to the desired conditions and objectives established in the draft plan. The monitoring questions ensure that monitoring efforts produce relevant data that can be successfully used to assess the accomplishments and effectiveness of various land management activities. The monitoring table identifies areas of concern or interest, and the evaluative process helps determine whether observed changes are consistent with desired conditions and objectives. The monitoring table also dictates the frequency of reporting, which includes the timing of monitoring and evaluation efforts. For example, most data will be collected annually, with reporting or evaluation of the data conducted at different intervals, such as annually or every 5 years depending on the resource. The indicator, statistic, or metric used to gauge program performance and answer monitoring questions is defined within the monitoring table.

## Climate

**Comment:** A commenter desires to see “additional research on climate change…in a revised or supplemental EIS” that includes research from four publications addressing climate change at the national scale.

**Response:** Appendix B of the proposed plan is a comprehensive assessment of climate change trends and potential climate change strategies—written specifically for the Southwestern Region—and includes some of the same research recommended by the commenter.

## Water and Watersheds

**Comment:** A commenter stated his belief that the report (DEIS) does not:

- contain a description of how this plan would differ from the old one, or
- discuss whether riparian degradation has anything to do with livestock, or
- address how much water is being pumped out of the aquifer with the numerous water developments, or how many there are, or

- discuss any of the other important elements of livestock grazing in this important and damaged and fragile 260,000-acre public landscape.

**Response:** Chapters 2 and 3 of the DEIS are devoted to presenting descriptions of the respective alternatives and to comparing environmental consequences of those plan alternatives. Additionally, both the proposed plan and the 1985 plan (alternative A) were available on the Cibola Web site, on CD, or in hardcopy for an interested reader to make their own comparison.

Riparian degradation is discussed in chapter 3, "Affected Environment for Water," pages 40 and 41 of the DEIS. This discussion clearly states the causes of the degradation being referred to, none of which are tied to livestock.

Page 41 of the DEIS presented the number of water wells on the Grasslands, as compared to those on state and private land within the administrative boundary. Volume of water pumped from wells on the Grasslands is highly variable on a seasonal or annual basis and also fluctuates with the number of livestock present, if any. These watering facilities provide water for wildlife as well as livestock. A discussion is also presented on page 41 regarding the huge impact of other uses upon aquifer recharge.

Effects of livestock grazing on the Grasslands are addressed throughout chapter 3 of the DEIS, particularly in the "Livestock Use" section, pages 110–111, but also throughout the "Vegetation" and "Water/Watershed" sections.

**Comment:** A commenter stated that he interprets the DEIS to say that alternative B would move the various ecological types toward desired conditions, while the current management would not. Something about the current management then, is negatively affecting this landscape, but the Agency never says what.

**Response:** Alternative A is the 1985 Cibola forest plan as written, with its various plan components that guide management direction. It is not necessarily current management, as much of the management direction in alternative A is outdated, or the plan was silent on certain issues, including desired conditions for the Grasslands' unique vegetation types and control of invasive species. Following alternative A direction for the next 15 years would again be omissive of clear direction for management of the unique Grasslands vegetation types. The DEIS (chapter 1, "Needs for Change," page 4; and chapter 2, "Alternatives, Including the Proposed Plan," page 12) addresses this issue with regard to vegetation types on the Grasslands. Similarly, part 1, "Introduction," page 6 of the proposed plan also addresses the need for change to alternative A in addressing management direction for vegetation types on the Grasslands.

## General Ecological

**Comment:** A nongovernmental organization believed that an alternative that emphasizes ecological restoration should be prepared, and that elements of such an alternative could be incorporated into a final plan.

**Response:** In chapters 2 and 3 of the DEIS, a description of and analysis of the proposed plan (alternative B) is presented with an explanation of plan components of that alternative that would direct management of vegetation types toward their historical reference condition. Similarly, the DEIS and proposed plan present a description of plan components that direct management for species viability of high at-risk species, management for class 1 watershed conditions, and

protection of air and water quality, playas, wetlands, and riparian areas. The Agency believes that the proposed plan, as well as alternative C (the wilderness alternative), are ecological restoration alternatives that simultaneously provide for multiple uses under the Multiple Use–Sustained Yield Act.

**Comment:** A commenter was concerned that the U.S. Forest Service assessment of current plant community departure from reference condition—and therefore, the conclusion that the draft plan will ensure the viability of native species—is arbitrary and capricious.

**Response:** U.S. Forest Service assessment of current plant community departure from reference condition was based on an objective, systematic method[1] published in a peer-reviewed, scientific journal and used on all national forests in Arizona and all national grasslands in New Mexico, Oklahoma, and Texas.

## Vegetation

**Comment:** A commenter believes that tallgrass should be listed as a dominant plant of the sand sagebrush vegetation type, even if it is no longer dominant because of cattle grazing.

**Response:** Tallgrasses are not dominant in the sand sagebrush vegetation type, even in the absence of grazing. Although they may be the tallest grass in this vegetation type, they are not dominant in terms of frequency, cover, or biomass. Vegetation types where tallgrasses are dominant occur on soils with a higher water holding capacity.

**Comment:** A commenter believes that the desired condition for the sand sagebrush vegetation type where plants <4 inches tall comprise 40–60 percent of the total vegetation conflicts with the condition that it is dominated by mid-grasses and sand sagebrush. Plant species richness should be emphasized.

**Response:** The desired condition for sand sagebrush vegetation type has been clarified—now saying plants 0–4 inches tall comprise 40–60 percent of the total vegetation cover—and does not conflict with the statement that it is dominated by mid-grasses and sand sagebrush, which are dominant in terms of structure.

The variety of seral stages included in the desired conditions reflects an emphasis on species richness (pages 88–89 in the draft plan).

**Comment:** A commenter believes that plans for pinyon-juniper management should distinguish woodland on steep slopes—especially the Mills Canyon slopes—from that on level ground. Stands on slopes should be left for wildlife cover and should not be burned except where regeneration of Gambel oak is needed.

**Response:** The proposed plan reflects a comprehensive consideration of soil and watershed health, vegetation reference conditions, wildlife habitat, fuels management, and heritage protection—and specifically addresses pinyon-juniper management on canyon side slopes—as exemplified by the following excerpts:

[1] Weisz, R.; Triepke, F. J.; and Truman, R. 2009. Evaluating the ecological sustainability of a ponderosa pine ecosystem on the Kaibab Plateau in northern Arizona. Fire Ecology 5(1): 100-114.

> "When determining size of openings in early and middle successional stage pinyon-juniper stands, habitat requirements of big game species and fuels reduction needs should be considered" (pinyon-juniper guidelines, p. 84).
>
> "Vegetation management activity conforms to valued landscape characteristics of the eligible scenic river" (Mills Canyon desired conditions, p. 93).
>
> "Fire-influenced areas are characterized by dense stands of Gambel and wavyleaf oak thickets; browse on side slopes provides habitat for mule deer" ("Woodland Pinyon-Juniper on Canyon Steep Slopes, Cliffs, and Rock Outcrops" desired conditions, p. 96).
>
> "Use prescribed fire at least once over the life of the plan to rejuvenate the browse component on the canyon side slopes" ("Woodland Pinyon-Juniper on Canyon Steep Slopes, Cliffs, and Rock Outcrops" objective, p. 97).

**Comment:** "We do not agree that the shelterbelts and windbreaks should all be cut down because of 'undesirable, invasive species' or issues with their tree seeds..."

**Response:** The proposed plan does not call for cutting down all shelterbelts. The proposed plan does provide guidance on situations where it is appropriate to remove shelterbelts and windbreaks and also where it would be appropriate to maintain them to provide habitat:

> "Invasive and/or undesirable trees such as black locust, Siberian elm, and eastern redcedar, among others, are not present where they could negatively impact desired vegetation composition and structure" (draft plan, p. 57).
>
> "Deciduous trees are present in isolated pockets along draws, shelterbelts, and around old homesteads to provide nesting habitat for raptors" (draft plan, p. 76).
>
> "Trees and tall human-made structures will be evaluated for removal in areas otherwise suitable as Lesser Prairie-chicken habitat" (draft plan, p. 72).

## Livestock Use

**Comment:** Some commenters believe that the proposed plan and DEIS are primarily for livestock, and that livestock grazing will not bring desired vegetation conditions and should be deemphasized, reduced, or disallowed.

**Response:** The Multiple Use–Sustained Yield Act of 1960 and the Forest and Rangeland Renewable Resources Research Act of 1978 mandate sustainable multiple use of national forests and grasslands, including livestock grazing.

The proposed plan ("Grasslands-wide Management Direction for Livestock Use," page 37) has a guideline stating, "Permitted grazing should allow for residual ground cover levels to provide for plant physiological needs, soil protection, wildlife habitat, and vegetation desired conditions." Where not specifically directed by the plan, livestock use would be conducted in accordance with law, regulation, policy, applicable NEPA decisions, (see proposed plan, appendix D) and through the use of best management practices and adaptive management to maintain a sustainable grazing resource.

Grazing has been used as a management tool on the Grasslands for decades, and all vegetation types are currently within reference condition for vegetative structure. Plan components will further facilitate vegetation management through grazing. Under all alternatives, adaptive management may deemphasize livestock grazing in response to drought, fire, or other conditions where destocking will help maintain or achieve desired conditions.

## Minerals and Energy Development

**Comment:** Some commenters note with some surprise the statement (DEIS at 89) regarding scenery that "[a]ctively producing oil and gas wells, as those that have been plugged and rehabilitated, are part of the BKMC NGs' rural landscape and not necessarily considered deviations from the desired landscape, but positive cultural features. Perhaps local residents are so used to seeing them that they are simply part of the natural landscape, but we are not sure that would hold true for tourists from other places."

**Response:** The DEIS at page 89 actually stated, "...many constituents consider the gas and oil developments to be part of the pastoral landscape and not a deviation from valued characteristics and would not have any consequences to the scenic resource."

The Agency agrees that tourists might not see oil and gas wells as part of the natural landscape. Readers should note that when the Federal government acquired the national grasslands, mineral rights below the surface were in many cases owned by non-Federal entities who had a legal surface occupancy right to their claim. Where non-Federal mineral rights occur under Federal lands, Agency managers work with mineral rights owners to achieve scenic integrity objectives in the area, but the owners are not compelled to follow Agency guidance on scenery for surface use operations. In part 2 of the proposed plan, Grasslands-wide plan components for scenery (page 18) seek to minimize alterations to the landscape character for future Federal oil and gas leases and emphasize following the form, line, color, texture, and pattern of the landscape character. In part 3 of the proposed plan, "Kiowa and Rita Blanca Management Area, Standards for Oil and Gas Leasing" (page 70), these plan components provide additional protection to the scenic landscape character of that area with regard to future oil and gas leases.

**Comment:** A commenter was concerned that commercial-scale wind farms may cause noise and light pollution, wildlife habitat fragmentation, increases in soil erosion and invasive plants, and adverse effects on tourism, recreation, scenery, and bird and bat populations.

The same commenter stated that the site-specific restrictions on wind, oil, and gas are not detailed in the DEIS; these restrictions should also be adopted on private land adjacent to the Kiowa National Grassland.

**Response:** The Energy Policy Act of 2005 recognizes the Forest Service's role in meeting the renewable energy goals of the United States. Consistent with Agency policies and procedures, the use and occupancy of NFS lands for alternative energy production—such as wind energy development—are appropriate and will help meet the energy needs of the United States. Forest Service directives provide consistent guidance and require adequate analysis for evaluating wind energy proposals and applications for issuing wind energy permits.

The Forest Service agrees that wildlife, especially birds and bats, may potentially experience increased mortality and habitat degradation resulting from wind energy development. Alternatives B (proposed plan) and C and Forest Service policy (common to all alternatives and

referenced in appendix D, page 210, "Wind Energy Development," of the proposed plan) address minimizing negative impacts to wildlife and habitat, as well as to soils, tourism, recreation, and scenery; from wind energy development. For example: The proposed plan (p. 36) and alternative C call for "mitigating impacts to resources and values" (desired conditions for wind energy development) and that "new utility construction and reconstruction of existing utility lines should use existing rights-of-way to the extent practical" (guidelines for wind energy development).

The Forest Service is also directed "to minimize detrimental social and environmental impacts (invasive species, soil erosion), including direct, indirect, and cumulative impacts" (FS Manual 2726.02a – Wind Energy Facilities). FS Handbook 2709.11, Chapter 73.32 further requires applicants for a permit for construction and operation of a wind energy facility to submit a plan of development (POD) for managing the introduction, spread, and removal of noxious weeds and invasive species.

All applications for a permit for construction and operation of a wind energy facility would undergo a project-specific environmental analysis of effects upon the Grasslands' resources, goods, and services, which includes tourism and recreation. The one-half mile buffer from developed recreation sites as described in the "Guidelines" (page 36, proposed plan) under the section "Wind Energy Development" is considered a minimum setback for noise and public safety. Individual project proposals would be required to evaluate a number of issues such as wildlife migrations, local zoning ordinances, and scenery before a permit to develop was approved.

Every plan component for wind, oil, and gas development were not detailed in the DEIS. The agency released the entire proposed plan (alternative B) concurrently with the programmatic DEIS so that interested readers could refer to that document when reading the DEIS. Plan direction and management approaches relevant to oil and gas drilling are presented in the proposed plan in several places: in the Grasslands-wide management direction of part 2 of the proposed plan under the heading "Minerals and Energy Development," pages 32–34; in part 3 "Management Area-Specific Management Direction for Black Kettle and McClellan Creek Management Area," pages 55–56; and in part 3, "Management Area-Specific Management Direction for Kiowa and Rita Blanca Management Area," pages 69–70. Additional guidance for oil, gas, and wind energy development as related to scenery is presented in part 2, "Grasslands-wide Management Direction," pages 17–19, 50–51, and 67–68.

It is not the responsibility of the Agency to impose site-specific restrictions on off-Grasslands wind, oil, and gas development. However, the Forest Service can and does share its knowledge of effects of energy development with non-Federal landowners and suggests others sources of expertise with whom a landowner might confer.

## Ecosystem Diversity | Wildlife and Habitat | Management Indicator Species

**Comment:** Some commenters believe that the selection of management indicator species is inadequate and does not represent all habitat types on the Grasslands.

**Response:** There is no requirement for selecting a MIS to represent each dominant vegetation type on the Grasslands. The purpose of MIS is to evaluate effects of alternatives and to monitor management of the preferred alternative post implementation.

The process to select MIS for alternatives evaluation and ecological indicators for monitoring is described and the rationale and decision outcome are documented in appendix G of the DEIS beginning on page 203.

In Part 6: "Monitoring Elements of the Draft Land and Resource Management Plan" provide ecological indicators to monitor the results of management. Mixed-grass, shinnery oak, and cottonwood-willow vegetation types use the presence and areal extent of undesirable trees and the mid and late successional stages of shortgrass prairie use range vegetation trend monitoring as ecological indicators of habitat and species viability.

The agency concurs that sand sagebrush is not represented by a monitoring element for an ecological indicator. This will be corrected in the proposed plan with the addition of range vegetation trend monitoring in sand sagebrush.

Aquatic habitat has course filter plan components in the proposed plan to assure habitat is maintained or improved as follows: Watersheds are in Class I condition. These watersheds meet water quality standards and support designated uses. Watersheds are characterized by high infiltration rates, low soil compaction, and minimal overland flow. Within the capability of the Grasslands, streams, springs, playa lakes, wetlands, and aquifers sustain water quantity and quality. Springs, wetlands, streams, and lakes are at proper functioning condition, and streams and lakes exhibiting unacceptable bank erosion are healed or healing.

"Management Approaches in the Proposed Plan for Riparian Area Management," TR 1737-15, 1998, "A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lotic Areas" and TR 1737-16, 1999, Revised 2003, "A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lentic Areas" may be used by managers to assess the proper functioning condition of watercourses, playas, and wetlands.

## Ecosystem Diversity | Water | Water Quality and Condition

**Comment:** Some commenters believe that the DEIS does not specify how alternative B will achieve proper functioning condition standards and how this alternative is better than alternative A.

**Response:** Chapter 2 of the DEIS presents a summary comparison of consequences by alternatives. Chapter 3 of the DEIS provides the pertinent details of the alternatives environmental consequences and comparison analysis.

Page 42 of the proposed plan provides background and description of surface water and riparian vegetation as well as water developments such as groundwater wells. After the background and description section are plan components that describe in detail how alternative B will achieve outcomes through desired conditions and guidelines that would achieve proper functioning condition. Proper functioning condition is described on page 43, footnote 15 as "A condition when adequate vegetation, landform, or large woody debris is present to: dissipate stream energy associated with high waterflow, thereby reducing erosion and improving water quality; filter sediment, capture bedload, and aid flood plain development; improve floodwater retention and groundwater recharge; develop root masses that stabilize streambanks against cutting action; develop diverse ponding and channel characteristics to provide the habitat and the water depth, duration, and temperature necessary for fish production, waterfowl breeding, and other uses, and support greater diversity."

The scope of alternative A adaptive management and protection of riparian areas does not adhere to proper functioning condition outcomes that alternative B describes.

## Ecosystem Diversity | Water | Groundwater

**Comment:** A commenter believes that the proposed plan is not responding quickly to aquifer depletion.

**Response:** The proposed plan identifies aquifer drawdown in the background and description of the "Water, Watershed…" section. As described in this section, most water developments, particularly on the KRB rely on groundwater to supply drinking water for wildlife and livestock grazing. The "Watershed Specialist Report" addresses groundwater depletion and drawdown concerns as follows: Groundwater depletion and drawdown are ongoing concerns in the prairie grasslands ecoregion. Within the Grasslands administrative boundary, approximately 1,500 water wells (80 percent) are on state and private land and 380 water wells (20 percent) are on Grasslands managed land. Most of the Grasslands are on the Ogallala aquifer, except for the Mills Canyon portion of Kiowa National Grassland which is over the Canadian River aquifer, and a small portion of Black Kettle units over the Washita Alluvium aquifer. There is minimal data available on the conditions of the smaller aquifers, but data on the Ogallala aquifer indicates that it has experienced extreme drawdown over the last 50 years. Pumping water for irrigation, municipal water supplies, and other uses exceeds the recharge ability of the aquifer.

Grasslands usage of water from the Ogallala Aquifer is minimal. The Grasslands has no control over the private sector water usage.

In the "Water, Watershed…" section, Alternative B has a desired condition designed to improve floodwater retention and groundwater recharge. Further on in the Kiowa Rita Blanca management area, page 80, desired conditions for the playa lake inclusions include statements that describe hydrologic functions, one of which is aquifer recharge. Objectives and guidelines further support the restoration of hydrologic functions and restrict activities that would adversely impact natural hydrologic functions.

### Ecosystem Diversity | Wildlife and Habitat | Species Viability

**Comment:** A commenter believes that recovery of the Lesser Prairie-chicken (LPC) depends on the establishment of connecting passageways.

**Response:** Connecting LPC habitat at the landscape level is beyond the ability of Grasslands management due to the fragmented nature of the Grasslands; many units with LPC habitat are separated by long distances, roads, or private land. However, LPC recovery requires habitat components that Grasslands management can address. Alternative B has plan components that produce important LPC habitat by the following desired condition: "The mixed grass species composition provides vegetation structure and height relationships necessary for ground nesting bird cover and brood rearing habitat. Small areas of short structured herbaceous vegetation or patches of bare ground are available for Lesser Prairie-chicken leks and courtship areas. Small areas or patches of bare ground are present that provide wildlife travel corridors, escape routes, and annual plant germination sites for wildlife foraging habitat." The shinnery oak and sand sagebrush vegetation types contain similar desired conditions for the LPC.

**Comment:** Some commenters believe that the proposed plan does not assure viability for at-risk species nor will the components described in the proposed plan produce the desired vegetative outcome. The commenters state that the proposed plan lacks enforceable standards.

**Response:** The proposed plan meets the viability determination as defined in the 1982 Rule Provisions, Section 219.19. Species viability determination described in the proposed plan on page 8 is a brief summary of the process. As stated there, the determination of species viability on the Grasslands is a culmination of assessing ecosystem characteristics (including vegetation type, soil, water, and air) found in the "Ecological Sustainability Report" (ESR) (USDA Forest Service 2011b).

Appendix F (Coarse Filter/Fine Filter and Viability Evaluations) of the DEIS for the proposed plan describes in detail the viability determination process and how plan components are developed, and in section 8 ("Monitoring") it discloses how the proposed plan will be effective as described in the subsection, "Procedures for Implementing Species Viability Provisions and Documenting Viability."

1. Grasslands vegetation is in low departure from reference condition and habitat derived from vegetation was found to be sustainable.
2. The proposed plan assures habitat through course filter/fine filter aspect of plan component development for vegetation through specific desired conditions, objectives, and guidelines. Page 12 of the proposed plan defines the various plan components in detail. Each vegetation type and inclusions have plan components crafted to support the respective ecological communities.
3. Species not adequately addressed by course filter plan components had threats to that species identified and plan components were developed to address those threats.
4. There is no requirement to make naturally rare species more common.

**Comment:** Some commenters believe that the proposed plan does not provide enforceable restrictions on the poisoning or shooting of black-tailed prairie dogs, would have negative consequences for all other wildlife, and lacks safeguards for the Lesser Prairie-chicken and riparian species.

**Response:** The black-tailed prairie dog (BTPD) is recognized as a Forest sensitive species, and both the BTPD and Lesser Prairie-chicken (LPC) were evaluated to be "at risk" for viability in the development of the proposed plan. On lands administered by the Grasslands, vegetation management is used to develop and improve habitat for Forest sensitive species, "at risk" species, and wildlife in general.

Wildlife is not managed by the national grasslands; however, site specific shooting restrictions can be put in place for species such as the black-tailed prairie dog.

Prairie dog poisoning is not in practice on lands managed by the Grasslands. Wildlife on the Kiowa, Rita Blanca, Black Kettle, and McClellan Creek, and all private land is regulated by the Texas Parks and Wildlife, New Mexico Game and Fish, and Oklahoma Department of Wildlife Conservation for the respective districts.

The proposed plan has management approach descriptions as follows: The Kiowa and Rita Blanca National Grasslands will strive to contribute to implementation of the recommendations of the multistate conservation plan for the black-tailed prairie dog.

The Grasslands are cooperating with the New Mexico, Oklahoma, and Texas offices of Wildlife Services, USDA APHIS in a memorandum of understanding (MOU) that addresses sylvatic plague disease in mammals occurring on the shortgrass vegetation type for the purposes of protection of human health, other wildlife resources, and boundary control.

The Grasslands are cooperating, through a MOU involving Federal agencies, to achieve the conservation and management of black-tailed prairie dogs and their habitat. The U.S. Forest Service, Animal Plant Health Inspection Service, Natural Resources Conservation Service, Bureau of Land Management, U.S. Fish and Wildlife Service, Bureau of Indian Affairs, National Park Service, U.S. Air Force, U.S. Army, U.S. Army Corps of Engineers (Civil Works), and U.S. Geological Survey agree that cooperative efforts will enhance the conservation and management of the Nation's short and mid-grass prairie and desert grassland ecosystems for the benefit of the black-tailed prairie dog and other obligate and associated species of these ecosystems.

**Comment:** Some commenters believe that the Grasslands should improve and increase habitat for a suite of native species including large carnivores and bison, and protection of high, at-risk species.

**Response:** The proposed plan has specific components developed to provide black-tailed prairie dog habitat which will benefit other species as well. First desired conditions starting on page 73 state the following: Low structured vegetation representative of the early successional stage of shortgrass prairie is available for a keystone species black-tailed prairie dog to colonize. The colonies provide habitat for swift fox, Mountain Plover, Golden Eagle, Ferruginous Hawk, and badger. Habitat for at least one complex of black-tailed prairie dog colonies is available for potential future reintroduction to recover the endangered black-footed ferret, a predator dependent on the black-tailed prairie dog; impacts from plague outbreaks to black-tailed prairie dogs and potential reintroduced black-footed ferrets are minimal.

Plan component objectives follow desired conditions to assure success as follows: Reintroduce prescribed fire in 1 to 10 percent of the vegetation type over the next 15 years after plan approval. Mechanically, chemically, or with prescribed fire remove from 5 to 10 percent of native invasive plants such as cholla, juniper, pricklypear, mesquite, and yucca annually.

Specific plan component guidelines are in place to reinforce the objectives and desired conditions as follows: Prescribed fire and targeted grazing of suitable black-tailed prairie dog habitat should occur only on loamy uplands, loamy plains, limey uplands, alkaline plains, loamy bottomlands, basalt loam, and clayey soils on 0 to 5 percent slopes. Timing of prescribed fire or other vegetation treatments should consider adverse consequences to nesting birds. Special use activities should be limited in Ferruginous Hawk nesting areas during the nesting period from March 1 to June 30 within 0.5 mile of any suitable nesting sites and/or April 1 to August 31 within 0.5 mile of any active nest. Research under Agency control should occur outside early nesting and incubation periods. Improving habitat and maintaining corridors for swift fox should be accomplished through timely burning, mowing, livestock grazing, and seeding.

Due to the landscape-scale degradation of the native ecosystems on Kiowa, Rita Blanca, Black Kettle, and McClellan Creek during the "Dust Bowl Era," soil stabilization was the first priority

when the Grasslands were established. On the four Grasslands, vegetation management has achieved structure features that are in low departure from reference condition and support a suite of native species. Natural processes that include grazing and fire are utilized to manage and influence plant structure and composition. The proposed plan has plan components in place in all vegetation types, soil, and water to achieve and maintain those plant structure and composition features. The four Grasslands are not contiguous tracts of land. They are defined by an administrative boundary that encompasses private land ownership as well as lands administered by the Grasslands. There are numerous roads administered by state and county jurisdiction along with Forest Service roads that bisect many Grassland units.

Administratively, under FSH, Part 222, Range Management, Grasslands units have grazing and livestock use allotments. Subpart A, Part 222.1, Authority and Definitions, details how range resources are permitted and regulated. It would be through these authorities that grazing use by bison would be permitted and regulated with the permittee owning and managing the bison.

Large carnivores were part of the original species list where viability evaluation began. Many species screened early to be not on the Grasslands, not affected by Grasslands management, and/or did not have population or habitat concerns. Species that did not filter through to the need for course or fine filter plan components were not discussed in the proposed plan but were listed in the overall species list in the ecological sustainability report.

Large carnivores use, as a prey base, the animals associated with the various types of habitat. The best Grasslands management can offer is optimum habitat for the prey base and ultimately support the carnivores. The representative states where the Grasslands reside are the authorities that regulate wildlife through category classification, such as fur bearing animal, protected, or regulated through hunting.

**Comment:** Some commenters believe that the proposed plan does not provide adequate protection and management of black-tailed prairie dogs.

**Response:** In part 3 of the proposed plan in the KRB Management Area on page 76 is a management approach that describes a cooperative agreement among several agencies. The following statement is from the MOU:

> "The Grasslands are cooperating with the New Mexico, Oklahoma, and Texas offices of Wildlife Services, USDA APHIS in a memorandum of understanding (MOU) that addresses sylvatic plague disease in mammals occurring on the shortgrass vegetation type for the purposes of protection of human health, other wildlife resources, and boundary control."

USDA APHIS has been dusting some of the Rita Blanca black-tailed prairie dog colonies with insecticide for fleas, the vector for sylvatic plague, since 2010. The MOU allows this activity to take place on the Grasslands. Black-tailed prairie dogs are not a federally protected species and the respective states associated with the Kiowa and Rita Blanca, designate prairie dogs as varmints that can be controlled as nuisance animals. On areas of the Grasslands where dusting and other methods to control plague in prairie dog colonies is taking place, the MOU allows controls where colonies are expanding off Grasslands onto private land.

Black-tailed prairie dog colonies have been monitored on the Kiowa and Rita Blanca National Grasslands beginning in 1999 by Kansas State University.

The Forest Service concurs that the DEIS "Soils" section (page 39) states "existing BTPD colonies (about 9,500 acres) would remain susceptible to soil erosion." This has been clarified in the FEIS which states, "BTPD colonies cover about 9,500 acres (3,800 acres occupied in 2011) of the KRB NGs. Currently occupied colonies are largely devoid of vegetation and may be prone to wind, sheet, and rill erosion."

The DEIS beginning on page 64 and ending on page 65, black-tailed prairie dog on shortgrass prairie acreage was determined from the analysis shown in appendix A of the "Vegetation and Wildlife Specialists Report" (VWSR). There are several different concepts being presented in both the DEIS and VWSP. One concept is that the DEIS uses ranges of acreage for comparison because these are projections of trends. Another concept is based on known acreage of BTPD colonies based on survey and monitoring since 1999.

The Grasslands are managed for vegetation cover, structure, and composition. It is through vegetation, soil types, slope, and other features on the landscape that prairie dog recruitment takes place. Plague has had the most influence over the areal extent of colonies since monitoring began.

The proposed plan has specific components developed to provide BTPD habitat. Desired conditions (starting on page 73) state desired structural and successional stages, objectives assure success through vegetation management goals, and guidelines are in place to reinforce the objectives and desired conditions.

Specifically the desired condition states: "Low structured vegetation representative of the early successional stage of shortgrass prairie is available for a keystone species, black-tailed prairie dog, to colonize. The colonies provide habitat for swift fox, Mountain Plover, Golden Eagle, Ferruginous Hawk, and badger. Habitat for at least one complex of black-tailed prairie dog colonies is available for potential future reintroduction to recover the endangered black-footed ferret, a predator dependent on the black-tailed prairie dog. Impacts from plague outbreaks to black-tailed prairie dogs and potential reintroduced black-footed ferrets are minimal."

**Comment:** Some commenters believe that there are no data included in the DEIS on the recorded use of poison to control prairie dogs and that documentation of BTPD poisoning should be included in any monitoring protocol.

**Response:** The DEIS is a document that describes a proposal, alternatives, and effects. The DEIS does not contain the kind of data outside of what is being compared and analyzed for effects or data that would not improve the effects analysis.

There is no proposed plan component for monitoring BTPD and it is not a MIS. BTPD poisoning is not an ongoing practice on the Grasslands.

In the proposed plan, a monitoring element is in place that tracks areal extent for early successional stage shortgrass prairie. This stage of shortgrass is considered to have the habitat expansion potential for BTPD depending on soil type and slope.

## Ecosystem Diversity | Wildlife and Habitat | Species Viability | Lesser Prairie-chicken

**Comment:** Some commenters acknowledged that state recommendations and guidelines for species habitat preference concerning Lesser Prairie-chicken was provided and used in the

Grasslands plan development. The comments further suggest using the "Five State Southern Great Plains Crucial Habitat Assessment Tool" (CHAT).

**Response:** The Agency concurs that guidelines for species habitat preferences supplied by the state and other agencies were integral in the development of the proposed Grasslands plan component for the LPC.

The proposed plan has guidelines in place that use best available science to be used for determining suitable habitat.

CHAT habitat assessment and acreage determination for LPC is summarized in the DEIS, chapter 3, "Affected Environment and Environmental Consequences" page 64.

## Ecosystem Diversity | Vegetation | All Vegetation Types

**Comment:** Some commenters believe that natural processes should be used to maintain restored native ecosystems that are populated by the historic suite of native species, and that bison should be reintroduced on the Grasslands.

**Response:** The national grasslands are managed under the auspices of CFR Ch. II (7-1-96 Edition) Part 213—Administration of Lands Under Title III of the Bankhead-Jones Farm Tenant Act by the Forest Service Authority: 50 Stat. 525, as amended; 7 U.S.C. 1010-1012. § 213.1 Designation, Administration, and Development of National Grasslands—

> "The National Grasslands shall be administered under sound and progressive principles of land conservation and multiple use, and to promote development of grassland agriculture and sustained-yield management of the forage, fish and wildlife, timber, water and recreational resources in the areas of which the National Grasslands are a part"…"In the administration of the National Grasslands the resources shall be managed so as to maintain and improve soil and vegetative cover, and to demonstrate sound and practical principles of land use for the areas in which they are located."

Due to the landscape-scale degradation of the native ecosystems on Kiowa, Rita Blanca, Black Kettle, and McClellan Creek during the Dust Bowl Era, soil stabilization was the first priority when the Grasslands were established. On the four Grasslands, vegetation management has achieved structure features that are in low departure from reference condition and support a suite of native species.

Natural processes that include grazing and fire are utilized to manage and influence plant structure and composition. The proposed plan has plan components in place in all vegetation types, soil, and water to achieve and maintain those plant structure and composition features. The four Grasslands are not contiguous tracts of land. They are defined by an administrative boundary that encompasses private land ownership as well as lands administered by the Grasslands. There are numerous roads administered by state and county jurisdiction along with Forest Service roads that bisect many Grassland units. Administratively, under Part 222, "Range Management," Grasslands units have grazing and livestock use allotments.

Subpart A, part 222.1, "Authority and Definitions," details how range resources are permitted and regulated. It would be through these authorities that grazing use by bison would be permitted and

regulated and just as livestock is owned and managed by permittees, bison would be owned and managed by the permittee as well.

None of the alternatives prohibits the introduction of bison on the national grasslands. Permittees could request permission from the Forest Service to run livestock other than cattle on their allotment, and the Forest Service would conduct a project-specific environmental analysis and renegotiate the terms of the permit if the request were allowed.

Management of bison on fenced pastures that are generally less than a section of land requires additional techniques and facilities—more than that required by cattle grazing. Fences have to be taller and stronger, or the bison have to be surrounded by electric fence and acclimated to it. Bison are not easily moved from one facility to another and have seasonal herd dynamics such as "rut" where mature bulls vie for dominance and are unmanageable.

The past role of bison as ecological engineers was dependent on unrestricted landscape. Today's anthropogenic barriers, land fragmentation, and development preclude bison from playing their former role at the landscape scale. If introduced on the Grasslands, bison's ecological impact would be management dependent, and their impact would probably not be much different than that of cattle—

> "…differences between the influence of free-roaming bison on pristine grasslands and semi-free-roaming bison on a fenced natural area must be much greater than those of the latter and domestic cattle."[2]

## Ecosystem Diversity | Wildlife and Habitat | Threatened and Endangered Species

**Comment:** Some commenters believe that the proposed plan lacks safeguards and specific habitat for the Lesser Prairie-chicken and riparian species.

**Response:** Habitat for the Lesser Prairie-chicken (LPC) and riparian species is supported by plan components that provide specific features that are identified in desired conditions, objectives, and guidelines.

Riparian areas have plan components in the Grasslands-wide Management "Water, Watershed, Perennial Streams…" section beginning on page 43 of the proposed plan. Beginning on page 86, plan components are in place for cottonwood-willow riparian areas with desired conditions, objectives, guidelines.

Plan components provide specific habitat for LPC. Desired conditions state: the mixed grass species composition provides vegetation structure and height relationships necessary for ground nesting bird cover and brood rearing habitat. Small areas of short structured herbaceous vegetation or patches of bare ground are available for Lesser Prairie-chicken leks and courtship areas. Small areas or patches of bare ground are present that provide wildlife travel corridors, escape routes, and annual plant germination sites for wildlife foraging habitat. In shinnery oak and sand sagebrush, small areas of short structured herbaceous vegetation or patches of bare ground are available for Lesser Prairie-chicken leks and courtship areas; these areas also provide

[2] Plumb, GE and Dodd, JL. 1993. Foraging ecology of bison and cattle on a northern mixed prairie: implications for natural area management. Ecological Applications 3:631-643.

wildlife travel corridors, escape routes, and annual plant germination sites for wildlife foraging habitat. Trees are nonexistent and collision risks from fences, etc., are minimal in areas important for recovery of Lesser Prairie-chicken.

Plan component objectives further enhance LPC habitat through the following: Mechanically or with prescribed fire, remove all undesirable trees on the mixed-grass prairie over the next 15 years after plan approval. Over the next 15 years after plan approval, retain shrubby cover across the landscape in patches that are no less than 5 percent or more than 25 percent of the total mixed grass area. Within 10 years of plan approval, mark 25 to 50 percent of fences in suitable Lesser Prairie-chicken habitat to minimize collisions of the bird with fences.

Guidelines are in place to assure LPC habitat in mixed grass and shinnery oak as follows: Trees in upland settings within landscapes suitable for Lesser Prairie-chicken habitat should be targeted for eradication. Prescribed fire should have a recurrence interval of 5 to 15 years to encourage forb production; timing should consider adverse consequences to ground nesting birds.

**Comment:** Some commenters stated that the proposed plan and DEIS violate the Endangered Species Act and the National Environmental Policy Act because they do not include a biological assessment or a biological opinion. In addition, the proposed plan would jeopardize the survival and/or recovery of listed species and would fail to conserve them.

**Response:** When the above comments were received, the proposed plan and DEIS were in the final stages of the initial 90-day comment period. After the 90-day comment period closes and responses are formulated, the regional forester selects a preferred alternative from those presented in the draft EIS. The preferred alternative (now the proposed plan) and a biological assessment (BA) will be presented to the U.S. Fish and Wildlife Service (FWS). The BA and a formal response from the FWS will accompany the final EIS. Effects to the Arkansas River shiner will be addressed in the BA.

The Forest Service does not concur with the commenter that the proposed plan would jeopardize the survival and/or recovery of listed species and would fail to conserve them. The proposed plan and the DEIS are programmatic and do not have direct effects. Beginning on page 56 of the DEIS, the “Threatened, Endangered, and Proposed Species” section covers the comment concern and also includes critical habitat.

After the proposed plan and record of decision are final and the plan is implemented, site specific environmental assessments would be completed prior to any activities taking place on the Grasslands.

## Ecosystem Diversity | Wildlife and Habitat | General Ecological | Wildlife Habitat Improvement

**Comment:** Some commenters stated that wildlife should have water available to them on the Grasslands, and cooperating agencies should be allowed to operate watering facilities.

**Response:** The Grasslands concur that wildlife should have water available year around. Page 56 of the proposed plan has the following guideline: Windmills at water wells should be kept running all year long when water availability and mechanical function permit, for wildlife benefit.

The Grasslands welcome cooperation of state agencies in operating and maintaining windmills for wildlife water during the nongrazing season.

**Comment:** "Piñon-juniper woodland is important to wildlife for cover, roosting, nesting, and food including juniper berries and piñon nuts. The trees invade grassland that is overgrazed…Any thinning should not aim at having 'trees farther apart' (for cattle forage) but at all age groups (thickets) of trees farther apart, for wildlife habitat."

**Response:** Pinyon-juniper invasion of grassland vegetation types results from reduced fire frequency caused by less fine fuel (drought, overgrazing) and fire suppression.

The proposed plan balances wildlife habitat requirements with forage production and strives to maintain the reference vegetation structure of vegetation types threatened by nonnative tree invasion. The proposed plan provides direction to manage vegetation types in a way that maintains habitat for grassland-obligate wildlife, including black-tailed prairie dog, Ferruginous Hawk, and swift fox. This includes removal of invasive species, prescribed fire, targeted grazing, and seeding (pages 74–75 in the draft plan).

The proposed plan also strives to maintain the reference vegetation structure of the pinyon-juniper and juniper-grassland vegetation types. The proposed plan's desired conditions call for a pinyon-juniper vegetation type that "is a mosaic of stand shape, size, spacing, and structural stages across the landscape reflecting the natural range of pinyon-juniper woodland" and a juniper grasslands inclusion where "trees occur as individuals or in smaller groups and range from young to old" (pages 83–85 in the draft plan).

## Ecosystem Diversity | Wildlife and Habitat | Cumulative Environmental Consequences to All Wildlife | Lesser Prairie-chicken

**Comment:** Some commenters believe that wind energy development would be contradictory to recreational uses, detrimental to wildlife and habitat, and should have siting restrictions for turbines and transmission lines to retain Lesser Prairie-chicken habitat.

**Response:** The proposed plan contains components or management approaches that require wind energy development to adhere to Forest Service guidance as follows: 36 CFR 251 Subpart B Land Uses, Special Uses; FSM 2700 Special Uses Management; FSH 2709.11, Chapters 40 and 70, Special Uses Handbook; FSH 2609.13, Chapter 80, Wildlife Monitoring at Wind Energy Facilities; Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 2006, Avian Power line Interaction Committee (APLIC) 2006; Edison Electric Institute, Washington D.C. Standard Guidance for Towers with Potential Impacts to Federally Listed Species and Migratory Birds (document prepared by the U.S. Fish and Wildlife Service, Oklahoma Ecological Services Field Office, 9014 East 21st Street, Tulsa, Oklahoma 74129-1428).

Plan components include desired conditions as follows: The Grasslands support alternative energy production and facilitate their development while mitigating impacts to resources and values. Wind energy developments are designed to minimize impacts to other uses and resources, in particular wildlife and scenic integrity.

Plan component guidelines state new utility construction and reconstruction of existing utility lines should use existing rights-of-way to the extent practical to provide utility access to private

land. Ground-disturbing activities associated with wind energy development should be avoided within 500 feet of eligible National Historic Register sites. Wind turbines should not be located within one-half mile of developed recreation sites and active prairie dog colonies.

## Human Influences | Livestock Use | Grazing and Wildlife

**Comment:** A commenter believes that livestock exclusion would benefit wildlife and the Grasslands overall.

**Response:** Grazing has been one part of the natural processes that led to the structure and composition features that form the basis of vegetation reference conditions on the Grasslands. Grazing is an important management tool used to manipulate habitat for wildlife by the intensity, duration, and timing of livestock use. One example for reference of plan component development is the Texas Parks and Wildlife LPC management plan that utilizes livestock grazing to optimize habitat for LPC.

The "Texas Parks and Wildlife Lesser Prairie-chicken Wildlife Management Plan"[3] states that "Duration and intensity of grazing must be balanced to increase or maintain good nesting and brood-rearing habitats, in addition to creating planned patterns of patchiness on the landscape. Therefore, a long-term (5 to 10 year) prescribed grazing plan (or schedule) must be prepared for all pastures. Light to moderate grazing (40–60 percent of growth remaining) provides needed nesting and brood rearing habitat. Diverse grazing pressure is desirable to create the needed patchwork of different vegetative heights, composition, interspersion, and increased food plant production."

## Ecosystem Diversity | Vegetation | Shinnery Oak/ Mixed Grass Prairie | Sand Sagebrush | Shortgrass Prairie

**Comment:** Some commenters believe that exclosures would preserve rare plants and wildlife nesting areas benefiting the Lesser Prairie-chicken and black-tailed prairie dog.

**Response:** The proposed plan has components for Lesser Prairie-chicken (LPC) habitat provisions. Desired conditions in the mixed grass vegetation have structure and height relationships necessary for ground nesting bird cover and brood rearing habitat. Small areas of short structured herbaceous vegetation or patches of bare ground are available for LPC leks and courtship areas. Small areas or patches of bare ground are present that provide wildlife travel corridors, escape routes, and annual plant germination sites for wildlife foraging habitat. In shinnery oak and sand sagebrush, small areas of short structured herbaceous vegetation or patches of bare ground are available for LPC leks and courtship areas; these areas also provide wildlife travel corridors, escape routes, and annual plant germination sites for wildlife foraging habitat. Trees are nonexistent and collision risks from fences, etc., are minimal in areas important for recovery of Lesser Prairie-chicken.

Plan component objectives further enhance LPC habitat through the following: Mechanically or with prescribed fire, remove all undesirable trees on the mixed-grass prairie over the next 15 years after plan approval. Over the next 15 years after plan approval, retain shrubby cover across

3 PWD 1046-W7000 (12/06)
http://www.tpwd.state.tx.us/publications/pwdforms/media/pwd_1046b_w7000_lesser_prairie_chicken_wmp.doc

the landscape in patches that are no less than 5 percent or more than 25 percent of the total mixed grass area. Within 10 years of plan approval, mark 25 to 50 percent of fences in suitable Lesser Prairie-chicken habitat to minimize collisions of the bird with fences.

Guidelines are in place to assure LPC habitat in mixed grass and shinnery oak as follows: Trees in upland settings within landscapes suitable for Lesser Prairie-chicken habitat should be targeted for eradication. Prescribed fire should have a recurrence interval of 5 to 15 years, to encourage forb production; timing should consider adverse consequences to ground nesting birds.

Exclosures placed around LPC habitat would not aid the manipulation of habitat components for the benefit of the species. Grazing is an important management tool used to manipulate habitat for wildlife by the intensity, duration, and timing of livestock use. The Texas Parks and Wildlife LPC management plan utilizes livestock grazing to optimize habitat for LPC (http://www.tpwd.state.tx.us/publications/huntwild/forms/index.phtml PWD 1046-W7000) (12/06). The “Texas Parks and Wildlife Lesser Prairie-chicken Wildlife Management Plan” states that duration and intensity of grazing must be balanced to increase or maintain good nesting and brood rearing habitats, in addition to creating planned patterns of patchiness on the landscape. Therefore, a long-term (5 to 10 year) prescribed grazing plan (or schedule) must be prepared for all pastures. Light to moderate grazing (40–60 percent of growth remaining) provides needed nesting and brood rearing habitat. Diverse grazing pressure is desirable to create the needed patchwork of different vegetative heights, composition, interspersion, and increased food plant production.

The proposed plan has specific components developed to provide black-tailed prairie dog habitat. First desired conditions starting on page 73 state the following: Low structured vegetation representative of the early successional stage of shortgrass prairie is available for a keystone species black-tailed prairie dog to colonize. The colonies provide habitat for swift fox, Mountain Plover, Golden Eagle, Ferruginous Hawk, and badger. Habitat for at least one complex of black-tailed prairie dog colonies is available for potential future reintroduction to recover the endangered black-footed ferret, a predator dependent on the black-tailed prairie dog; impacts from plague outbreaks to black-tailed prairie dogs and potential reintroduced black-footed ferrets are minimal.

Plan component objectives follow desired conditions to assure success as follows: Reintroduce prescribed fire in 1 to 10 percent of the vegetation type over the next 15 years after plan approval. Mechanically, chemically, or with prescribed fire remove from 5 to 10 percent of native invasive plants such as cholla, juniper, pricklypear, mesquite, and yucca annually.

Specific plan component guidelines are in place to reinforce the objectives and desired conditions as follows: Prescribed fire and targeted grazing of suitable black-tailed prairie dog habitat should occur only on loamy uplands, loamy plains, limey uplands, alkaline plains, loamy bottomlands, basalt loam, and clayey soils on 0 to 5 percent slopes. Timing of prescribed fire or other vegetation treatments should consider adverse consequences to nesting birds. Special use activities should be limited in Ferruginous Hawk nesting areas during the nesting period from March 1 to June 30 within 0.5 mile of any suitable nesting sites and/or April 1 to August 31 within 0.5 mile of any active nest. Research under Agency control should occur outside early nesting and incubation periods. Improving habitat and maintaining corridors for swift fox should be accomplished through timely burning, mowing, livestock grazing, and seeding.

Exclosures around black-tailed prairie dog habitat would allow vegetation to move toward mid to late successional stages. Grazing animals maintain early successional low structure vegetation stages that prairie dogs use as colony recruitment areas. Exclosures would produce an undesirable outcome for prairie dog colony recruitment.

## Managed Recreation | Recreation | Dispersed and Motorized Recreation

**Comment:** Some commenters believe roads that hinder wildlife in any way should be removed or have their access limited to necessary maintenance/habitat protection use, and that the proposed plan does not address road densities that will increase risks to wildlife.

**Response:** The Kiowa, Rita Blanca, Black Kettle, and McClellan Creek National Grasslands are not contiguous tracts of land. They are defined by an administrative boundary that encompasses private land ownership as well as lands administered by the Grasslands. There are numerous roads administered by state and county jurisdiction along with Forest Service roads that bisect many Grassland units. Individual units are in many cases bordered by roads with access limited by fences with gated entrances. Grasslands internal administrative roads are not open to the public.

The Black Kettle and McClellan Creek NGs have completed travel management assessments and a motor vehicle use map is in effect that restricts off-road use except for designated areas.

Travel management on the Kiowa and Rita Blanca has been completed, and both road densities and wildlife concerns were addressed in a travel management environmental assessment and decision notice. A final motor vehicle use map is anticipated to be available during the fall 2012 and will guide visitors to all legal access areas.

## Ecological Diversity | Vegetation | Wildlife and Habitat | Management Indicator Species

**Comment:** Some commenters are concerned that there are no MIS to ensure viability of the native flora and fauna that inhabit mixed grass prairie, shinnery oak, sand sagebrush, and cottonwood-willow vegetation types on the Grasslands.

**Response:** There is no requirement for selecting a MIS to represent each dominant vegetation type on the Grasslands. The purpose of MIS is to evaluate effects of alternatives and to monitor management of the preferred alternative post implementation. The process to select MIS for alternatives evaluation and ecological indicators for monitoring is described, and the rationale and decision outcome are documented in appendix G of the DEIS beginning on page 203.

In part 6: “Monitoring Elements of the Land and Resource Management Plan” provide ecological indicators to monitor the results of management. Mixed-grass, shinnery oak, and cottonwood-willow vegetation types use the presence and areal extent of undesirable trees and the mid and late successional stages of shortgrass prairie use range vegetation trend monitoring as ecological indicators of habitat and species viability.

The Agency concurs that no MIS or ecological indicator was identified for sand sagebrush. A monitoring element is in place in the proposed plan that will use range vegetation trend monitoring as the ecological indicator of habitat and species viability.

Cassins's Sparrow will not represent sand sagebrush as the MIS as the collaborating team of state and Federal agency biologists concurred.

## Ecological Diversity | Vegetation | Wildlife and Habitat | Management Indicator Species | Wildlife Management Indicator Species

**Comment:** Some commenters believe that the plains leopard frog should be designated as MIS for cottonwood-willow and that there is no MIS for aquatic habitat. They believe that Chytrid fungus is a threat to the plains leopard frog on the Kiowa and Rita Blanca National Grasslands. They also stated that the proposed plan does not provide adequate protection for the plains leopard frog or its habitat.

**Response:** The selection criteria for MIS beginning on page 203 of the DEIS states: "Management indicator species is a concept adopted by the Agency to serve, in part, as a barometer for species viability at the forest level…To estimate the effects of planning alternatives on fish and wildlife populations, certain vertebrate and/or invertebrate species shall be selected as MIS. These species are to be selected because their population changes are believed to indicate the effects of management (1982 Rule Provision 219.19(a)(1))." The bulleted statements of process criteria are defined and reveal how MIS assessment and selections were made.

Flows of the Canadian River upstream of the Grasslands have been diverted for agricultural and domestic use purposes leaving areas such as Mills Canyon with diminished flows. The criteria used for MIS selection states that management activities are required to have significant influence on the habitat or the species. Grasslands management has no ability to influence the Canadian River flows or climate change.

A commenter references the proposed plan, page 177, appendix B, "Climate Change Trends," specifically riparian habitat. The reference provides information about climate change trends and the influence on riparian habitat. Within the context of those two paragraphs is support for the conclusions that riparian systems are not well represented by MIS.

A commenter agrees that drought may be a primary threat to the plains leopard frog. The determination made by the team of state and Federal agency biologists is that aquatic habitat would have influences that Grasslands management could not significantly affect and no MIS or ecological indicator would appropriately represent trends. The plains leopard frog would not be a representative management indicator species.

The plains leopard frog was assessed to be at-risk for viability on the Kiowa and Rita Blanca Management Areas that are hot and dry and the habitat is ephemeral—Chytrid fungus, fish, and invasive bullfrogs do not inhabit these areas.

Appendix F, "Coarse Filter/Fine Filter and Viability Evaluations" of this document describes procedures used in the Grasslands Plan for implementing and documenting viability of species.

Coarse filter and fine filter plan components were developed in the proposed plan as follows: Desired condition watersheds are in Class I condition. These watersheds meet water quality standards and support designated uses. Watersheds are characterized by high infiltration rates, low soil compaction, and minimal overland flow. Within the capability of the Grasslands, streams, springs, playa lakes, wetlands, and aquifers sustain water quantity and quality. Springs,

wetlands, streams and lakes are at proper functioning condition, and streams and lakes exhibiting unacceptable bank erosion are healed or healing.

Management approaches in the proposed plan for riparian area management TR 1737-15, 1998, "A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lotic Areas" and TR 1737-16, 1999, Revised 2003, "A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lentic Areas" may be used by managers to assess the proper functioning condition of watercourses, playas, and wetlands.

Beginning on page 86, plan components are in place for cottonwood-willow riparian areas with desired conditions, objectives, guidelines that are in support of aquatic life and the "at risk" for viability plains leopard frog.

## Human Influences | Livestock Use | Grazing and Livestock Use

**Comment:** A commenter believes that livestock use will hamper the restoration of riparian vegetation in general, and in Mills Canyon specifically.

**Response:** Establishment of native riparian vegetation is limited primarily by altered hydrologic function resulting from off-Grasslands water diversion (draft EIS, p. 52). Saltcedar control treatments are ongoing in the riparian areas and the proposed plan will continue to restore the riparian woody and herbaceous community.

Draft plan guidelines address protection for riparian vegetation under grazing:

> "Permitted grazing should allow for residual ground cover levels to provide for plant physiological needs, soil protection, wildlife habitat, and vegetation desired conditions" (page 37 in the draft plan).
>
> "Grazing should be managed to promote or maintain riparian obligate vegetation" (page 65 in the draft plan).
>
> "Grazing should be managed to promote or maintain riparian woody vegetation" (page 87 in the draft plan).

Forest Service Manual direction (FSM 2070.2, 2238.23.5[c], 2241.11) also addresses protection for riparian vegetation under grazing.

Page 42 of the DEIS describes the livestock use in Mills Canyon. Currently, livestock permits are unobligated on the largest riparian unit (K-91), and grazing is limited in other parts of the riparian area (K-136, K-135, and K-87).

## Human Influences | Wind Energy Development

**Comment:** A commenter believes that wind speed on the Kiowa NG is minimally desirable for renewable energy.

**Response:** The average annual wind speed at 80 meters above ground level on the Kiowa in eastern New Mexico and Rita Blanca on the Texas and Oklahoma Panhandles has been calculated by wind resource estimates developed by AWS Truewind LLC for wind navigation provided to National Renewable Energy Laboratory (NREL).

Average annual wind speed on KRB is 8.5 meters per second which is 19.1 mph.

Average annual wind speed suitable for wind energy development is 6.5 meters per second or 14.5 mph.

## Species Diversity | Vegetation/Wildlife and Habitat | Species Viability

**Comment**: Some commenters believe that suitable Lesser Prairie-chicken sites that would have removal of trees and tall structures are not identified, so any such action cannot be monitored and is unlikely to happen. They further commented that the Lesser Prairie-chicken won't prosper on the Kiowa unless areas are identified and sand sagebrush is "prepared" for them by extremely light grazing or none at all, and that the shrub component should exceed 15 percent cover.

**Response:** The proposed alternative provides the desired conditions and guidance for management of vegetation and habitat. Because it is programmatic, it does not identify specific sites to take action. Habitat and vegetation management projects would require site-specific environmental analysis, including the identification of specific locations to be treated. Trees and tall human-made structures would be evaluated for removal in areas important for recovery of Lesser Prairie-chicken habitat and where windbreaks and erosion control shelterbelts are no longer needed for soil stability.

After further review of the scientific literature, the Agency agrees with the commenter, and desired conditions for the sand sagebrush vegetation type will be changed in the final plan to call for >15 percent shrub cover, thus providing a mosaic of habitats with varying amounts of grass, forb, and shrub cover to satisfy the range of structure requirements of the Lesser Prairie-chicken (lekking, nesting, brood rearing). Livestock grazing may be useful in creating such desired conditions, as grazing can be used to increase shrub cover.

Sand sagebrush vegetation type guidelines, page 90 of the proposed plan, present design criteria for site-specific projects that would "prepare" areas as suitable habitat for Lesser-Prairie chicken, should they return to the Kiowa and Rita Blanca National Grasslands.

CHAT habitat assessment and acreage determination for LPC is summarized in the DEIS, chapter 3, "Affected Environment and Environmental Consequences," page 64.

## Research Natural Areas

**Comment:** Some commenters believe that research natural areas (RNAs) should be established in the shortgrass, sand sagebrush, and pinyon-juniper vegetation types. Section 2 of T26N R36E , which is used by the Rocky Mountain Research Station for fire studies in shortgrass prairie, should be designated as an RNA and removed from livestock grazing.

**Response:** The Forest Service considered establishing RNAs in several vegetation types on the Grasslands. As briefly discussed below, no areas were identified that met the criteria for RNA establishment.

*Shortgrass.* Past reclamation projects (i.e., plantings and seedings) may not have been genetically compatible with historical strains of native plants. Exotic species are present. Establishing T26N R36E Sec. 2 as an RNA would interfere with research currently being conducted by the Rocky Mountain Research Station.

*Sand sagebrush.* Plant community species composition is not representative of the vegetation type. Many exotic species are present.

*Pinyon-Juniper.* Because of fragmented ownership, the contiguous areal extent of this vegetation type is too small for RNA consideration. A number of RNAs have already been established or proposed in the pinyon-juniper type. In the Southwestern Region alone, there are five RNAs containing over 3,500 acres of pinyon-juniper on four national forests—including over 1,000 acres of pinyon-juniper on the Cibola National Forest—and another seven RNAs containing roughly 2,000 acres of pinyon-juniper have been proposed on four national forests.

While the Forest Service is authorized (FSM 4063), but not required, to establish RNAs, the planning process allows for future RNA proposals by amendment during the life of the plan if the ecological condition of a unit improves to the point where RNA recommendation criteria are met. (See regional guidance http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5181253.pdf).

## Heritage

**Comment:** A commenter expressed concern that only three pages in the draft plan address heritage resources, the information presented for heritage is minimal, and the draft plan does not adequately address heritage resources if the Agency's goal is to manage land and resources.

**Response:** Heritage is addressed on pages 27, 28, 54, and 69 of the draft plan. In addition to that, pages 99–102 contain plan components that provide protections for the Santa Fe National Historic Trail. Appendix D of the draft plan is titled, "Other Sources of Information, Regulations, MOUs, Guidance." This appendix contains existing laws, regulations, MOUs, Forest Service policy, and references to best management practices. Page 208 and 214 have extensive lists of directives for managing heritage resources and special areas. The 1985 plan typically reiterated the direction and policy inherent in these documents. This draft plan takes a different approach; rather than restate the content of the various directives, they are included by reference. This allows some flexibility, by including this content in an appendix rather than the body of the plan, when documents are added or superseded, we can make changes without amending the plan, while still following the direction/guidance of the updated directive.

The heritage resource program is funded through natural resource programs such as timber, range, and fire and fuels. Most heritage work (about 80 percent) takes place in support of those resource areas as Section 106 compliance work. Section 106 compliance work is an evaluation required by the National Historic Preservation Act (NHPA) to consider the effects of projects we carry out, approve or fund on historic properties. It is the primary source for survey, discovery, and documentation of heritage sites. About 20 percent of the heritage program work is unrelated to other resources. This is typically Forest Service "Passport in Time" volunteer archaeology and historic preservation projects, restoration and maintenance on priority asset sites, Section 110 survey (Section 110 of NHPA governs Federal agency programs by providing for consideration of historic preservation in the management of properties under Federal ownership or control.), interpretation, outreach, training, and conferences.

After reviewing your comments, we have added a Grasslands-wide management approach to determine National Register of Historic Places eligibility for unevaluated archaeological sites on each Grassland.

**Comment:** One commenter wrote "It would be beneficial if the Final ElS [sic] include the Washita Battlefield National Historic Site, located within the Black Kettle National Grassland."

**Response:** The final EIS does not address the Washita Battlefield National Historic Site (WBNHS) because none of the alternatives would have environmental consequences for the WBNHS. While the WBNHS Visitor Center is colocated with the Black Kettle district ranger's office, the National Park Service—not the Forest Service—manages the WBNHS.

## Wilderness

**Comment:** One commenter supports alternative C, the wilderness alternative, believing that wilderness designation would make successful law enforcement regarding unauthorized motorized activity more likely.

**Response:** The Agency does not concur with the belief that recommendation of wilderness designation would have an effect upon successful law enforcement of unauthorized motorized activity in Mills Canyon. There is no precedent in the Agency for additional law enforcement personnel being assigned to a unit because of a wilderness recommendation or designation. Further, the motor vehicle use map that will be issued after the decision document is signed for the Kiowa and Rita Blanca National Grasslands travel management environmental assessment will restrict public motorized use to designated roads and trails and provides sufficient authority to cite and prosecute unauthorized motorized use.

**Comment:** A commenter believes that designated wilderness is unnecessary in this area and will limit management options, contributing to the deterioration of resource conditions.

**Response:** Per Section 219.17 of the 1982 Planning Rule and FSH 1909.12 Chapter 70 (Wilderness Evaluation), we are required to evaluate potential wilderness areas and make recommendations to Congress for potential designation. Additionally, both alternatives B and C contain guidelines and objectives for managing vegetation and wildlife habitat conditions sustainably. See the desired conditions under each management area for detailed descriptions.

**Comment:** Some commenters found the wilderness evaluation to be flawed and believe that inappropriate rankings were assigned on a number of factors including capability (manageability), availability, and need.

- The wilderness evaluation inappropriately reduced the capability rating for the area because of difficulties in preventing off-road vehicle trespass due to the open nature of the Grassland and proximity to private lands. This commenter agrees that it's appropriate to consider the manageability of boundaries, but believes that this consideration should occur during the availability stage and not the capability stage of the analysis.
- The wilderness evaluation inappropriately reduced the capability rating because external sights and sounds should not be important factors when evaluating an area for wilderness designation. The commenter estimated that roads and developed recreation facilities are visible from within about one third of the PWA.
- The wilderness evaluation inappropriately reduced the availability rating because of a presumption (on the part of the Forest Service) that vegetation restoration would be precluded should wilderness be designated.

- The commenter thinks the rating for the evaluation factor “need” should be increased because there are no designated wilderness areas on a national grassland, which creates a representative gap in the Wilderness Preservation System.

**Response:** The purpose of wilderness and the broad direction for managing wilderness are in the Wilderness Act of 1964, 1982 Planning Rule Provisions Section 219.17 (Evaluation of roadless areas), and FSH 1909.12 Land Management Planning Handbook, Chapter 70, Wilderness Evaluation.

An area recommended as suitable for wilderness must meet the tests of capability, availability, and need. The principle characteristics as described in the Wilderness Act are evaluated under capability: natural, undeveloped, outstanding opportunities for solitude or primitive unconfined recreation, special features and values, and manageability. The first four consider how current conditions of the potential wilderness area (PWA) fit the definition of wilderness; manageability evaluates features that would make it more or less difficult to manage as a wilderness, such as size and shape, and juxtaposition to external influences. Boundaries affect the manageability of an area, thus are considered a factor under capability, and not availability. This is consistent with the wilderness Evaluation process described in FSH 1909.12, Chapter 70.

The PWA was *originally* ranked “low” for manageability because protecting the wilderness character would require closing existing and frequently used roads, OHV use, and other access issues that have become less relevant as a result of travel management (TM) planning. In response to this comment, we reviewed the evaluative criteria for manageability as written in the wilderness evaluation report, and replaced the “access criteria” with “boundary management criteria” as directed in FSH 1909.12, Chapter 70, page 15. We ranked the boundary management factor as medium (See the revised wilderness evaluation report, page 27). In addition, we eliminated the second factor under manageability—motorized use, because the site-specific environmental analysis for TM addressed that topic thoroughly. Thus, we eliminated the two low rankings for manageability and added one medium. We consider the revised evaluative factor to be more responsive to current conditions and Agency direction, however, the overall ranking for capability did not change and remains “medium.”

The PWA has not been disqualified from consideration due to sights and sounds from outside the PWA. The PWA was ranked “low” on undeveloped and “medium” for outstanding opportunities for solitude or primitive unconfined recreation due to the many roads and structures within the canyon (see pages 25 and 26 of the wilderness evaluation). While some of the roads and developed campgrounds are within a “cherry stem” and technically outside the PWA boundary, they are visually prominent within the PWA. It would be incorrect to say they do not impact the experience of isolation. The PWA was ranked medium for “capability,” and has not been disqualified from consideration for this or any other reason.

The PWA was ranked “low” for wildlife species, populations, and management needs because management activities along the Canadian River are expected to be intensive and to occur every 5 years or more often. We considered changing the ranking of this factor to “medium,” however, that presumes that treatment would occur somewhere less than every 10 years and not more frequently. That would be an incorrect assumption as the FEIS for Canadian River tamarisk control specifies some mechanical treatments to occur between late July and late September for up to 5 years following initial treatments, which began in 2008–2009. The use of fire was considered as an alternative for tamarisk control, but was eliminated from consideration because fire only kills the aboveground portion of the plant leaving the below ground root structure to

resprout (see the FEIS and ROD for Canadian River Tamarisk Control, 2007). The overall ranking for "availability" was "medium" and does not assume that less intensive restoration activities such as backpack spray (hand treatment) would be precluded if wilderness was designated.

The need for an area to be designated as wilderness is determined on a regional basis. We evaluate the geographic distribution of areas and representations of landforms and ecosystems to determine "need." It is correct that there are no wilderness areas designated on national grasslands; however, there is no evaluative factor that compels us to consider the status of federally owned land (national forest or grassland, national park, etc.) when evaluating "need." The wilderness evaluation report provides an inventory of other wilderness areas with similar landform and vegetation, ecoregions and subregions, and five other factors for "need." Based upon this and other evaluative criteria from FSH 1909.12, Chapter 72.31, the PWA was ranked "low" for need.

**Comment:** Some commenters believe that the FEIS should contain additional maps including the inventoried roadless area (IRA), expanded wilderness boundary proposal, Canadian River PWA, and additional unroaded lands. They thought the wilderness evaluation should assess all of the IRA for capability for wilderness designation, and the proposed plan should have standards for managing IRAs.

**Response:** The Canadian River IRA map was excluded from the DEIS because it creates unnecessary confusion for the public. During the Roadless Area Review and Evaluation (RARE II) process, the Canadian River IRA was mapped to include private land within the Forest Service administrative boundary and included private land outside the Forest Service proclamation boundary, on the west up Canon Colorado. It contained more than a section of State Trust land. During production of the "Forest Service Roadless Area Conservation FEIS Volume 2- Maps of Inventoried Roadless Areas," 2000, a correction was made to exclude the land outside the proclamation boundary, but other cartographic errors, such as the inclusion of state land, persist on the official map. Obviously, the Forest Service does not have the authority to designate private or state land as inventoried roadless. While not included in the DEIS, the IRA map is available as part of the planning record, or online at http://roadless.fs.fed.us.

In our wilderness evaluation, we analyzed the wilderness potential of the full portion of the Canadian River IRA that falls on Forest Service land, plus a portion of the land held by the State of New Mexico. The area evaluated for wilderness capability within the report differs from the IRA only in that we excluded all private land and some of the state land from evaluation. The ecological and social values associated with the IRA are described in detail within the Canadian River PWA evaluation. The desired conditions for the Mills Canyon Management Area (which includes all of the Canadian River IRA), as described in the proposed plan (page 95) are clear that the Forest Service intends to maintain a semiprimitive nonmotorized character for the management area to preserve its outstanding recreation and natural features. The Canadian River IRA is the only unroaded area in the planning area.

A map of the Canadian River PWA is located on page 41 of the "Kiowa National Grassland Wilderness Evaluation Report, Canadian River PWA."

We have not received a map of the "citizen recommended" expanded wilderness boundary from the New Mexico Wilderness Alliance. However, in 2006, the proponent submitted two detailed

GIS maps showing an inventory of roads they would recommend for decommissioning on the Mills Units of the Kiowa. The maps and management recommendations were submitted for consideration for both plan revision and travel management implementation. The maps do not include the expanded wilderness boundary as suggested, but include the Canadian River IRA boundary as described above. The 2006 New Mexico Wilderness Alliance maps have been retained as part of the planning record. Although maps of the expanded wilderness boundary were not received, the proposal to expand the PWA boundary above the canyon rim was considered as an alternative during alternative development, and was eliminated from further consideration for a number of reasons. See page 26 of the DEIS under "Alternatives Considered, but Eliminated from Detailed Study."

**Comment:** One commenter believes that wilderness designation would provide enforceable protections for plants, wildlife, and the ecosystems upon which they depend.

**Response:** Both alternatives B and C contain guidelines and objectives for managing vegetation and wildlife habitat. See the desired conditions under each management area for detailed descriptions. Be aware that the Forest Service manages wildlife habitat, and the respective states are responsible for managing wildlife populations.

**Comment:** A commenter thinks off-road activity in Mills Canyon is a strong reason to designate wilderness. Classifying the management area as an unroaded back-country area is not enforceable and won't attract visitors seeking a remote experience.

**Response:** "Unroaded back country" is an expression used to describe the characteristics of a geographic region that is remote and undeveloped. Merriam-Webster considers the term to be synonymous with hinterland. It is not intended to be construed as an enforceable designation. However, implementation of the Travel Management Rule, and publication of the motor vehicle use map will prohibit cross-country travel and will designate roads and trails for motor vehicle use. Once published, the MVUM will be the legal enforcement tool of these designations.

**Comment:** Some commenters approve of the management direction as described in alternatives B and C and support recommendation of Mills Canyon as wilderness. One commenter also believes that designating the Canadian River as "wild and scenic" would reinforce habitat recovery.

**Response:** We have noted your management preferences for the Canadian River.

We do not believe that a wilderness designation and designation as "wild and scenic" would be necessary for habitat recovery. Alternatives B and C provide desired conditions, objectives, and standards and guidelines that would promote creation of good habitat. In addition, active management would be restricted if the area was a wilderness or the river was classified as "scenic." Active management may be needed to meet the plan's desired conditions. For example, the New Mexico Department of Agriculture organized the Canadian River Riparian Restoration Project (CRRRP) to address control of invasive species like tamarisk, riparian species revegetation/restoration, long-term management, maintenance, and monitoring of the Canadian River. The Forest Service is working with this group to control tamarisk infestations on the portion of the river that traverses the Kiowa National Grassland.

## Recreation

**Comment:** Some commenters would like us to include a plan guideline stating that we will develop a stand-alone recreation plan that will prescribe recreation goals, objectives, and activities for achieving the desired conditions; and provide specific permissions or prohibitions regarding prairie dog shooting in either the plan or a stand-alone recreation plan.

**Response:** Goals, objectives, and guidelines for recreation can be found on pages 19, 22, 24, 25, and 26 of the proposed plan. The plan provides broad guidance and information for project and activity for decisionmaking. The plan is strategic in nature, and does not include project and activity decisions such as where prairie dog shooting might be allowed. Those decisions are made later, after specific proposals are made and analyzed.

Guidelines are applicable to project or activity design and execution. They are sideboards for projects and activities to help achieve the desired conditions and objectives. It would be inappropriate to include a guideline stating that we are planning to develop another plan. See page 13 for more information about plan components.

**Comment:** A commenter is concerned that the DEIS is deficient in that it does not disclose or discuss the effects of recreation on water resources or wildlife. The DEIS also failed to disclose recreational use data (NVUM).

**Response:** The land management plan provides a programmatic framework that guides site-specific actions, but does not authorize, fund, or carry out any project or activity. Because the land management plan doesn't authorize or mandate any site-specific activities or ground-disturbing actions, there can be no direct effects. This is a programmatic DEIS, not a site-specific project where the effects of recreation upon other resources would typically be analyzed.

NVUM data was used in the "Recreation Specialist Report" under the section titled "Cumulative Environmental Consequences." The NVUM information remained in the specialist report as background material and was not carried forward into the DEIS. The data used can be found on page 9 of the "Recreation Specialist Report." NVUM data for all national forests and grasslands is available online at <www.fs.fed.us/recreation/programs/nvum>.

**Comment:** A commenter is concerned that the use of off-highway vehicles around the rim of Mills Canyon can cause destruction to habitat within the area.

**Response:** The area above the rim would be included in the larger Kiowa and Rita Blanca Management Area in the proposed plan. Implementation of the Travel Management Rule will designate roads and trails for motor vehicle use, restrict motorized dispersed camping to designated corridors, and display those designations on a motor vehicle use map (MVUM). These actions will reduce the potential for adverse effects on habitat from unmanaged motor vehicle use. After the MVUM is published, it will be the enforcement tool requiring motor vehicles to stay on the designated system and for prohibiting motorized cross-country travel. See the "Desired Conditions" for "Motorized Recreation" on page 24 of the proposed plan.

**Comment:** A commenter would like us to construct interpretive exhibits on the rim and a nonmotorized trail from the rim to the canyon bottom.

**Response:** The proposed plan is strategic in nature, and the EIS does not address project-specific actions such as the construction of interpretive exhibits. The draft plan contains objectives to

construct two new nonmotorized trails in the Mills Canyon Management Area within 15 years of plan approval, but does not specify the location pending site-specific analysis. Grasslands-wide desired conditions and objectives for nature-based tourism and heritage resources include developing more natural and historic interpretive programs/sites, but do not specify location pending project proposal and site-specific analysis.

**Comment:** A commenter would like us to remove the campground facilities from the canyon bottom and relocate them to the rim.

**Response:** The proposed plan is strategic in nature and does not include project and activity decisions. Those decisions are made later, after specific proposals are made and analyzed. Under the National Forest Management Act of 1976 (NFMA), projects and activities must be consistent with the plan.

In 2008, the Forest Service completed construction on two new campgrounds: Rim Campground (on the rim) and Mills Canyon Campground (in the canyon bottom). The decision regarding the location of these facilities was made as a result of an environmental analysis completed for the Mills Canyon Campground. It would not be technically feasible, or popular, to remove the camping facilities from the canyon bottom and reconstruct them on the rim, where a new campground already exists.

**Comment:** A commenter wants to include a plan guideline to establish developed (designated) dispersed campsites to protect areas from damage due to unmanaged dispersed camping. The commenter wants additions to the guidelines for Grasslands-wide dispersed camping to include a 200-foot buffer from any water body, and prohibited in sensitive plant or wildlife area.

**Response:** A 200-foot buffer for dispersed camping around water bodies is consistent with the seven principles of “Leave No Trace Outdoor Ethics” which are summarized on most forest visitor maps, other recreation brochures, and online. The Agency expects recreation users to follow those principles to reduce the impacts of human presence on the land and to preserve the outdoor experience for future generations. However, because of fluctuating water levels, the impracticality of enforcing a plan guideline such as this, and the administrative tools the Agency already has to manage camping designations, we disagree that a plan guideline establishing such a buffer would be needed. Implementation of the Travel Management Rule and publication of the motor vehicle use map (MVUM) will also designate areas and corridors for dispersed camping. The MVUM will be legally enforceable. Specifying a buffer around sensitive plant and animal communities would require us to publish those locations, which we avoid doing because it generates interest and increases human activity in those areas. The rangers do have administrative authority to close areas to provide protective measures for plants and wildlife as needed.

**Comment:** Some commenters would limit tourism and prohibit road construction and off-road use on the Grasslands. Because the proposed plan does not contain project specific information, the commenter wants the objective to construct two new nonmotorized trails in the Mills Canyon Management Area (p. 94 of the proposed plan) removed from the document.

**Response:** A land and resource management plan (LRMP) is strategic in nature. It does not include project decisions such as trail locations. Those decisions are made later, after project proposals are made and analyzed. Under the National Forest Management Act (NFMA), project proposals must be consistent with the LRMP.

Alternatives B and C promote nature-based and heritage tourism on the Grasslands. The Agency anticipates that increases in this low impact recreational activity can provide economic growth in these very rural counties. Nature-based and heritage tourism would emphasize a particular Grassland area or feature such as the playa lakes and bird watching, and provide interpretive sites that help the public understand the history of the southern Great Plains.

While no road construction is proposed, the proposed plan contains objectives and extensive management approaches for decommissioning roads no longer needed for administration of NFS lands. Guidelines are in place for design, construction, and maintenance consistent with best management practices.

Implementation of the 2005 Travel Management Rule (36 CFR 212) will designate roads and trails for motor vehicle use, prohibit cross-country travel on the Grasslands, and display these designations on a motor vehicle use map (MVUM). Once published, the MVUM will be the legal tool for enforcing and prohibition of motorized cross-country travel.

## Recreation and Wilderness

**Comment:** Six nongovernmental organizations suggested that both the plan and DEIS would benefit from the addition of more detailed maps and photographs in the recreation and wilderness sections.

**Response:** The proposed plan contains 36 color photographs and 18 maps, including 7 maps related to recreation, scenery, and the eligible scenic river. The DEIS contains 15 maps. All maps were available on the Cibola NF Web site with expanded resolution and were reproduced within the hardcopy documents at an 8.5 x 11 inch size due to expense of color reproduction for en masse printing for public distribution. Similarly, the "Kiowa National Grassland Wilderness Evaluation Report" and the sustainability and evaluation reports referenced in appendix B of the DEIS and available on the Cibola NF Web site were at the 8.5 x 11 inch size. Larger size printed or electronic versions of all maps were available upon request, and indeed some interested readers did so and were sent larger maps by mail during the comment period.

## Roads and Access

**Comment:** A commenter is concerned about retaining vehicular access to facilitate ranching.

**Response:** Decisions to close or restrict access on specific roads were made during travel management planning. As part of that process, the Forest identified the road system needed for safe and efficient travel, and for administration, utilization, and protection of National Forest System lands. Roads needed for ranching/livestock grazing would have been identified during that process. Roads not designated for motor vehicle use or displayed on the motor vehicle use map that are needed for ranching and other administrative use will be available to permittees under the terms of their permits.

**Comment:** A commenter wants all user groups to have equal access to all areas.

**Response:** Decisions regarding motorized access on the national forests and grasslands are determined during travel management planning. Public access will be guided by the motor vehicle use map (MVUM) upon publication. The MVUM will be legally enforceable. See the section titled "Roads and Access" on pages 28–30 of the proposed plan for more information.

**Comment:** Some commenters think the proposed plan should contain more direction for travel management: The desired conditions for "roads and access" in the draft plan should contain guidelines designating where public access will be permitted and where it will be prohibited. The plan should set the standard for motorized use, not travel management. The plan should have standards and guidelines designating corridors for dispersed camping and big game retrieval per 36 CFR 212.51(b). The plan should include a standard limiting motorized dispersed camping and prohibiting motorized big game retrieval. The travel management decision may be delayed, so the proposed plan should prohibit cross-country travel on KRB to reduce damage to vegetation and wildlife. The proposed plan should include the TAP and minimum road system in an appendix. The plan should contain a standard establishing maximum road density in areas of ecological importance. The proposed plan should have a standard for implementing the minimum road system within 15 years. The commenters believe that the proposed plan should guide motorized vehicle access, rather than the site-specific environmental assessment for travel management planning.

**Response:** The proposed plan provides broad guidance and information for project decisionmaking and is strategic in nature. It does not contain project and activity decisions such as permitting or prohibiting vehicular access on individual roads. Desired conditions are statements of social, economic, and ecological outcomes to be achieved in the future; they are aspirational, rather than project specific commitments. Desired conditions guide managers in planning future actions to be achieved over the life of the plan. Thus, the desired conditions, standards, and guidelines for "roads and access" will not address the management of specific roads. Page 208 of appendix D of the proposed plan titled, "Other Sources of Information, Regulations, MOUs, Guidance" contains a comprehensive list of legislation and directives that road engineers and recreation managers refer to when project planning and decisionmaking. Site-specific environmental assessments are done to guide travel management decisions.

The travel management atlas (INFRA roads database) is available to the public at the forest supervisor's office. The TAP is part of the travel management project record available at the district ranger's office in Clayton, NM. It is not required as an appendix to the LRMP.

The KRB travel management EA and decision notice have been completed and are available for viewing on the Cibola National Forest Web site at http://www.fs.fed.us/nepa/nepa_project_exp.php?project=30061. A final motor vehicle use map is anticipated to be available during the fall 2012 and will guide visitors to all legal access areas. This map will be available and in effect in a matter of months, not years. The specialist reports with supporting analysis and documentation for wildlife and vegetation are part of the project record located at the Kiowa and Rita Blanca National Grasslands district ranger's office in Clayton, NM. The travel management project record for the Black Kettle National Grassland is available at the district ranger's office in Cheyenne, Oklahoma.

The effects of unmanaged motor vehicle use is discussed briefly under "Roads and Access" on page 104 of the DEIS. The effects of unmanaged recreation on wildlife, water, scenery, and other resources are described in detail in the travel management environmental assessments for the respective districts.

**Comment:** A commenter believes we should protect wilderness and prohibit destruction by ORV use.

**Response:** We agree that unmanaged off-road use can be destructive to the environment. Implementation of the Travel Management Rule on the Grasslands will designate roads and trails for motor vehicle use. The "Environmental Assessment for Travel Management on the Kiowa and Rita Blanca National Grasslands" and decision notice are available for viewing at http://www.fs.fed.us/nepa/nepa_project_exp.php?project=30061. The selected alternative prohibits motorized cross-country travel. The Black Kettle and McClellan Creek National Grasslands have been closed to motorized cross-country travel since 1990.

## Special Areas and Areas of Interest

**Comment:** A commenter thinks it would be preferable if the unauthorized stream crossings could be closed or rehabilitated sooner than the 10 years cited in the objective under "eligible scenic river" in the proposed plan.

**Response:** We would like to complete the work earlier as suggested, however funding for this type project is dependent upon congressional allocations. As such, our ability to commit funds and staffing is somewhat unpredictable. We believe we would be able to accomplish the closures and rehabilitation at least in 10 years.

## Nature-based Tourism

**Comment:** A commenter thinks that more nonmotorized recreation and ecotourism would provide economic benefits to local economies.

**Response:** Alternatives B and C recognize that wildlife viewing and birding are becoming increasingly popular on the Grasslands. Our desired conditions include developed interpretive sites, nature trails, and outdoor classrooms for students and wildlife enthusiasts. Objectives include development of interpretive sites and educational/enrichment programs. See page 26 of the draft plan for other management approaches for nature-based tourism. Heritage resources would offer the public similar interpretive and educational opportunities.

**Comment:** Some commenters want the plan to emphasize natural educational/learning opportunities and nonmotorized recreation in Mills Canyon. They recommend adding standards to the proposed plan that would codify Recreation Opportunity Spectrum (ROS) classifications and prohibit all motorized use in Mills Canyon other than administrative use on the 600 Road.

**Response:** The proposed plan does not include any site-specific actions for guided tours or educational programs in the canyon; however, the proposed plan has Grasslands-wide objectives under nature-based tourism and heritage resources to offer educational/enrichment programs or field trips annually. More intensive educational programs and tours would potentially be inconsistent with the desired conditions of the area, and would be more consistent with a popular national park or wildlife refuge. The desired conditions for integrated recreation and scenery within the Mills Canyon Management Area are consistent with the desired conditions you described for the area. Please see pages 92–93 of the draft plan for the desired conditions, and appendix A for maps of the proposed ROS categories.

The ROS classification system is used by recreation planners and landscape architects to guide the type and intensity of use an area will be managed to accommodate. It is not an enforcement tool designed to restrict access by Agency personnel. Travel management planning determines which roads/trails should be designated for motor vehicle use, and which may be restricted to

administrative use only. The designations will be legally enforceable upon publication of the motor vehicle use map.

Because the 600 Road provides public access to the recently reconstructed Mills Canyon Campground, it would be inappropriate to designate it for administrative use only. The designation of roads for motor vehicle use will be determined through travel management planning.

**Comment:** A commenter would like the national grasslands to offer wildlife viewing/interpretive amenities similar to those found in a wildlife refuge or nature center.

**Response:** The land and resource management plan provides broad guidance for project and decisionmaking on the Grasslands for approximately the next 15 years. The plan is strategic in nature, and does not include project and activity decisions. Those decisions are made later, after specific project proposals are made and analyzed. Under the National Forest Management Act (NFMA), projects and activities must be consistent with the plan.

Development of an interpretive site for prairie dog viewing would be consistent with plan direction for nature-based tourism. The Grasslands provide outstanding opportunities for viewing birds and other wildlife. The desired conditions for nature-based tourism emphasize Grassland areas or features such as playa lakes, bird watching, and other wildlife viewing and photography. Providing interpretive sites, nature trails, and outdoor classrooms for wildlife watchers and bird enthusiasts are features that could be considered at a later date as project-specific proposals to meet the desired condition.

**Comment:** Some commenters expressed an interest in promoting economic growth through ecotourism. A range of activities could include wildlife viewing, photography, and hunting. An ecosystem restored using fire and populated by native species would enhance opportunities for ecotourism.

**Response:** The desired conditions and objectives of the proposed plan are compatible with promoting economic growth through ecotourism. The desired conditions emphasize playa lakes, bird watching, wildlife viewing, and photography. Interpretive sites, nature trails, and outdoor classrooms would be developed. Objectives in the proposed plan include educational/enrichment programs for nature-based tourism and heritage, increased interpretive materials, and heritage resource preservation activities. See pages 26–27 of the proposed plan and pages 99–104 for information on special areas and the Canadian eligible scenic river. We anticipate that visitation to these unique features will increase and promote economic growth in the rural communities. Providing interpretive sites, nature trails, and outdoor classrooms for wildlife watchers and bird enthusiasts are features that could be considered at a later date as project-specific proposals to meet the desired condition.

The Grasslands do not manage herds of animals or manage wildlife in general, only wildlife habitat. A permittee could request that the terms of his permit be changed to include other species of animals such as bison or sheep; however, the very fragmented ownership pattern (small noncontiguous, fenced parcels) on the Grasslands might preclude the introduction of bison on the national grasslands.

Planned and unplanned fire is frequently used to mimic the historical role of fire on the landscape and as a tool to achieve other resource objectives such as fuels reduction.

**Comment:** A commenter suggests that grazing bison would improve the land and increase wildlife viewing opportunities.

**Response:** The Grasslands do not manage wildlife, only wildlife habitat. Grazing permittees can request to change the species grazed on their allotment, however, the fragmented nature (small fenced parcels) of Federal ownership on the Grasslands would naturally limit the number of bison an allotment could hold. This would not be a wide open prairie with large herds of wild animals freely roaming that would contribute to wildlife viewing opportunities.

## Minerals, Energy Development, and Special Uses

**Comment:** Some commenters think the boundary of Mills Canyon needs clarification with respect to the buffer for surface occupancy for oil and gas development. We should define the 17-mile segment and name major side canyons that are excluded from surface occupancy (page 70 of the draft plan). We should address the effects of new road construction associated with oil and gas development on recreation uses and wildlife.

**Response:** The Agency concurs. The standards for oil and gas leasing on the Kiowa and Rita Blanca Management Area are described on page 70 of the draft plan. These standards are carried forward from amendment 12 of the 1985 LMP. Amendment 12 added new oil and gas leasing standards in response to "expressions of interest" on the Grasslands. We agree that the 17-mile segment and major canyons should be defined. The (approximate) 17-mile segment of the Canadian River includes FS lands along the river within the administrative boundary. Surface occupancy would be excluded 500 feet back from the rim of the canyon along that 17 mile river segment. The major canyons that have exclusions 500 feet back from their respective rims (on FS lands) are Canon Emplazado, Canon de la Cueva, Canon Mesteno, a small unnamed spur associated with Canon Mesteno, Canon Vercere, Canon Mestenito, an unnamed feature (spur) to the south of Canon Mestenito coincident with the 600 Road to include Rim Campground, Canon Colorado, Arroyo Piedra Lumbre, and Canon Biscante. We have mapped the area with the buffer and added it to the final plan and planning record. We added a footnote on p. 70 of the proposed plan describing the geography and directing the reader to the map.

Roads constructed in association with oil and gas development would provide private access on leased land to energy development sites. They would not be open to the public for recreation use. Guidelines are in place Grasslands-wide for road construction and rehabilitation of sites disturbed in association with oil and gas development. See page 31–34 of the draft plan.

**Comment:** Some commenters are concerned that the proposed plan is lacking direction to monitor air, water, and soil pollution as a result of oil and gas production. One commenter is concerned that standards for oil and gas production are more lenient than those for wind energy development.

**Response:** Energy production on Federal lands is guided by law, regulation and policy. See appendix D "Other Sources of Information, Regulations, MOUs, Guidance" of the proposed plan for the existing laws, regulations, and policy. There are extensive regulations for minerals and energy development, wind energy development, soil, water, and air management. The content of these regulations are not reiterated within the text of the plan, but are included by reference. Compliance with these regulations is mandatory.

The proposed plan contains standards for oil and gas leasing that prohibit surface occupancy around lakes, playas, and steep slopes (see pages 55 and 70 of the proposed plan). Project-specific decisions would identify monitoring needs based on specific concerns, and would document those responsibilities as terms of the lease.

## Land Adjustments

**Comment:** A commenter thinks the "Land Adjustments" section of the plan to be vague, and it doesn't encourage rights-of-way adjustments to increase public access to parcels surrounded by private lands.

**Response:** Land adjustments are guided by existing laws, regulations, and FS policy. The information guiding land acquisition and other resources can be found in appendix D (p. 207) of the proposed plan. The background and description (p. 28) for "Roads and Access" identifies legal access on the Grasslands to be a concern. Pages 28–30 under "Roads and Access" of the proposed plan also contains an objective to acquire legal access to four to six isolated Grassland units as opportunities arise.

## Socioeconomic Resources

**Comment:** A commenter found that the DEIS failed to disclose economic impacts for different types of recreation on the Grasslands, and failed to disclose the economic impacts of protecting environmental amenities such as clean air, clean water, and back-country experience.

**Response:** The economic impact analysis is presented on page 121 of the DEIS. It describes the economic impacts (jobs and labor) of the four revenue-generating activities on the Grasslands. The four revenue-generating programs are: minerals, livestock grazing, recreation, and nonrecreation special uses. The economic impact analysis is followed by the economic efficiency analysis on page 124, which calculates present net value (PNV) for each of the four program areas based on annual revenues and costs. PNV is required by the 1982 Rule Provisions 219.12(g). Recreation was also analyzed qualitatively on pages 91–95 of the DEIS. That section has a detailed analysis of dispersed and motorized uses (including hiking, hunting, camping, and OHV), developed recreation (including interpretive sites, camping, picnicking, and water-based recreation), and the ROS classifications that allow recreation planners to manage areas for a variety of recreation experiences including rural, roaded natural, semiprimitive motorized, and semiprimitive nonmotorized. See page 92 for more information on how ROS classes affect a visitor's recreation experience.

The 1982 Rule does not require us to analyze the *economic impacts* of environmental amenities such as clean air, clean water, and back-country recreation experience. However, these resources were analyzed *qualitatively* in the DEIS under the affected environment and environmental consequences for each resource. The analysis for water and water quality can be found on pages 40–43. The analysis for air and air quality can be found on pages 43–45, and the analysis for recreation is on pages 91–95.

**Comment:** A commenter is concerned about consistent access to forage on the Kiowa National Grassland because livestock grazing is essential to maintain viability for the producers and communities.

**Response:** The plan provides for continued grazing on the Grasslands, however, cattle numbers and strategies are expected to fluctuate in response to drought, wildfire, prescribed fire, and other factors that change range conditions. Implementation of livestock numbers and grazing strategies are addressed in site-specific grazing decisions and allotment plans. Please see pages 37–38 of the proposed plan for more information about livestock use.

**Comment:** A commenter takes issue with profit-making opportunities on public land; they ask that we do not allow money making projects on the Grasslands, and to assure that the proposed plan does not sanction money making projects on the Grasslands.

**Response:** Many laws establish the purposes, management, and administration of the national forests and grasslands. Under the Multiple Use–Sustained Yield Act (MUSYA) of 1960, "the National Forests are established for outdoor recreation, range, timber, watershed, and wildlife and fish purposes." The MUSYA authorizes the agency to "develop and administer the renewable surface resources of the National Forests for multiple use and sustained yield of the several products and services obtained therefrom." Contrary to the comment, the Forest Service's primary objective is not to provide "profit opportunities for corporate America on public land." Accomplishing the direction to "develop and administer the renewable surface resources" often requires permits or contracts with private industry or individuals for management activities. These permits and contracts include the opportunity to provide subsistence and profit. This is consistent with law, regulation, and policy.

## Air

**Comment:** A commenter is concerned that several management options (fire or vegetative thinning and harvesting) identified in the proposed plan have the potential to impact air quality. The commenter said that it is important to follow county and local ordinances when implementing the management activities identified in the proposed plan. The commenter referenced New Mexico Administrative Code (NMAC) 20.2.72 for construction permit regulations pertaining to air quality.

**Response:** Air quality standards and management practices are addressed by law, policy, and regulation. Please see appendix D of the proposed plan, "Other Sources of Information, Regulations, MOUs, Guidance." Pages 209 through 212 list the guidance specific to timber harvest ("Special Forest Products"), fire use ("WUI"), air quality, and soil. The content of these directives are not reiterated within the plan, but are incorporated by reference. Appendix D of the proposed plan under the section titled "Air" includes a reference to NMAC Title 20, Chapter 2, Part 3 Ambient Air Quality Standards. Part 72, "Permitting," has been added to the appendix as recommended.

The community wildfire protection plans (CWPP) for Harding, Mora, and Union Counties in New Mexico are included under the section "Wildland-Urban Interface" on page 210 (appendix D) of the proposed plan. There are no CWPPs for the counties occupied by the Grasslands in Texas or Oklahoma, but future CWPPs are incorporated by reference. Compliance with these directives is mandatory.

Local laws would be followed where they do not conflict with Federal law.

## Letters Received from Federal, State, Local, and Tribal Governments During the 90-Day Public Comment Period.

The following Federal and state agencies submitted letters during the DEIS comment period. No local governments or tribes responded. Copies are provided, following the below list.

- New Mexico Department of Agriculture
- New Mexico Department of Game and Fish
- New Mexico Environment Department, Air Quality Bureau
- New Mexico Environment Department, Surface Water Quality Bureau
- Oklahoma Archeological Survey
- Oklahoma Department of Wildlife Conservation
- U.S. Department of the Interior
- U.S. Department of Transportation, Federal Aviation Administration
- U.S. Environmental Protection Agency

NM STATE UNIVERSITY

New Mexico Department of Agriculture
Office of the Director/Secretary
MSC 3189
New Mexico State University
P.O. Box 30005
Las Cruces, NM 88003-8005
Phone: (575) 646-3007

December 20, 2011

Mr. Champe Green, Forest Planner
Cibola National Forest and Grasslands
Grasslands Plan Revision
2113 Osuna Road, NE
Albuquerque, NM 87113

Dear Mr. Green:

New Mexico Department of Agriculture (NMDA) submits the following comments in response to the draft Kiowa, Rita Blanca, Black Kettle, and McClellan Creek National Grasslands Land and Resource Management Plan (RMP) and draft Environmental Impact Statement (EIS).

Part of NMDA's vision is "…proactive advocacy and promotion of New Mexico's agricultural industries." Our comments focus on effects this RMP may have on the range livestock industry and natural resources associated with the Kiowa National Grasslands (KNG) in New Mexico.

NMDA supports sustainably managed livestock grazing as a congressionally mandated use of federal lands that is vital to the ranching industry and beneficial to wildlife and associated natural resources. The importance of consistent access to forage on the KNG cannot be overstated for the ranching industry in northeastern New Mexico. Livestock grazing on KNG allotments helps maintain economic viability for producers and communities. The RMP and EIS analysis of the preferred alternative recognizes the important contributions of the range livestock industry to achievement of desired resource conditions and economic sustainability of rural communities.

NMDA is opposed to the potential wilderness recommendation described as Alternative C in the EIS. We support protection of special resource values on public lands; however, designation of the Mills Canyon area as wilderness would result in a lack of management and deterioration of resource conditions. Mechanized equipment is necessary to conduct prescribed burns, invasive plant treatments, and riparian restoration essential to restoring and maintaining ecosystem and watershed functions. The proposed RMP provides for protection of special resource values in the Mills Canyon area while not restricting management options for resource improvement.

Mr. Champe Green, Forest Planner
Page 2
December 20, 2011

In conclusion, NMDA supports a decision to implement the proposed RMP and believes the analysis provided in the EIS supports this. Thank you for the opportunity to comment on this proposal. We request you continue to keep us informed of this and other planning decisions on the Cibola National Forest and Grasslands.

Sincerely,

Jeff M. Witte
Director/Secretary

LO/ya

GOVERNOR
Susana Martinez

DIRECTOR AND SECRETARY
TO THE COMMISSION
James S. Lane, Jr.

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DEPARTMENT OF GAME & FISH

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BILL MONTOYA
Alto, NM

October 21, 2011

Nancy Rose, Forest Supervisor, Cibola National Grasslands
2113 Osuna Road NE
Albuquerque, New Mexico 87113

Re: Draft Environmental Impact Statement and Resource Management Plan for the Kiowa, Black Kettle and McClellan Creek National Grasslands; NMDGF No. 14618

Dear Ms. Rose,

In response to your letter dated September 22 regarding the Draft Environmental Impact Statement (DEIS) for the National Grasslands, the Department of Game and Fish (Department) appreciates being included in all phases leading up to development of the revised 1985 plan. Department biologists and habitat specialists were included in formation and selection of criteria for management indicator species (MIS) on the Kiowa/Rita Blanca (KRB) management areas approved in November of 2010. This included both intra- and inter-agency discussions and should provide a good template for moving selected vegetation types to a more historical condition.

The Department has reviewed the Draft Grasslands Land and Resource Management Plan. We support the management direction within the preferred alternative (Alternative B) and the inclusion of the identical alternative (Alternative C), which includes a recommendation for moving the Mills Canyon Management Area into a proposed wilderness area designation. The preferred alternative includes many of the Department's previous recommendations, such as consideration of Lesser Prairie Chicken (LPC) candidate species status and guidelines for species habitat preferences. Inclusion of pre-site guidelines for wind turbine energy development were also noteworthy as a recommendation in the RMP, as well as increased habitat values for possible reintroduction of LPC on portions of the KRB management areas.

A major change in the direction of the new RMP (Alternatives B and C) is the incorporation of a desired vegetation structure and species composition. This was recommended in our previous response for the Cibola Forest Plan Revision (DGF # 13232). Landscape restoration on a larger scale should be included as a major goal. Within the Southern Shortgrass Prairie Ecoregion habitat types, little is known concerning the effectiveness of restoration using current

management practices such as prescribed livestock grazing. Fragmentation of the shortgrass prairie, and the causes and extent of this fragmentation, is also largely unknown. Historical referencing, as recommended in the new RMP, may improve the sustainability of these habitat types.

For more information on listed and other species of concern, contact the following sources:

1. BISON-M Species Accounts, Searches, and County lists: http://www.bison-m.org
2. Habitat Handbook Project Guidelines: http://wildlife.state.nm.us/conservation/habitat_handbook/index.htm
3. For custom, site-specific database searches on plants and wildlife, go to http://nhnm.unm.edu, then go to Data, then to Free On-Line Data, and follow the directions
4. New Mexico State Forestry Division (505-476-3334) or http://nmrareplants.unm.edu/index.html for state-listed plants
5. For the most current listing of federally listed species **always** check the U.S. Fish and Wildlife Service at (505-346-2525) or http://www.fws.gov/southwest/es/NewMexico/SBC.cfm.

Thank you for the opportunity to review and comment on your project. If you have any questions, please contact Scott Draney, Northeast Area Habitat Specialist at (505) 751-4738 or scott.draney@state.nm.us

Sincerely,

Kenneth K. Cunningham
Assistant Chief, Technical Guidance Section
Conservation Services Division

KKC/sd

xc: USFWS NMES Field Office
Chris Neary, NE Area Operations Chief, NMDGF
Scott Draney, NE Area Habitat Specialist, NMDGF

NEW MEXICO
ENVIRONMENT DEPARTMENT

*Office of the Secretary*

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DAVE MARTIN
Cabinet Secretary
BUTCH TONGATE
Acting Deputy Secretary

October 24, 2011

Nancy Rose
Forest Supervisor, Cibola National Forest and Grasslands
2113 Osuna Road NE
Albuquerque, NM 87113

**RE: Request for information concerning the Draft Environmental Impact Statement for the Kiowa, Rita Blanca, Black Kettle, and McClellan Creek National Grasslands Land and Resource Management Plan, Mora, Harding, Union, and Colfax Counties, New Mexico. (NMED File Number: 3551 ER)**

Dear Mrs. Rose:

Your letter regarding the above named project was received in the New Mexico Environment Department (NMED) and was sent to various Bureaus for review and comment. Comments were provided by the Air Quality Bureau and are as follows.

**Air Quality Bureau**
The New Mexico Environment Department-Air Quality Bureau has evaluated the Draft Environmental Impact Statement for the Kiowa, Rita Blanca, Black Kettle, and McClellan Creek National Grasslands Land and Resource Management Plan concerning lands located in Mora, Harding, Union, and Colfax Counties, New Mexico. All New Mexico counties identified in this draft statement are considered to be in attainment with all New Mexico and National Ambient Air Quality Standards.

Several management options identified in this management plan have the potential to impact air quality. The use of fire as a treatment option for land and resource management will increase particulate matter (PM) emissions in the area. Participation in New Mexico's Smoke Management Program (SMP) is required for all burn activities that exceed ten (10) acres per day or piled vegetative material in excess of one thousand (1,000) cubic feet per day. For more information about the SMP, please visit;
http://www.nmenv.state.nm.us/aqb/SMP/smp_index.html.

Heavy equipment used for vegetative material thinning or harvesting may be subject to requirements within the state construction permit regulation. For this and other combustion-related equipment that may be used during this project, please refer to 20.2.72 NMAC for applicability and air quality permitting requirements.

Dust control measures should be considered to minimize the release of particulates due to vehicular traffic and ground disturbances. If activities result in significant ground disturbance, the project area should be reclaimed to avoid long-term problems with erosion and fugitive dust.

Activities identified in this management plan may increase local emissions and temporarily impact air quality in the area. It is important that all county and local ordinances are followed when implementing activities identified in this management plan. Negative impacts associated with activities identified in this resource management plan will be minimized if regulations and guidelines identified in this document are followed.

I hope this information is helpful to you.

Sincerely,

Julie A Roybal

Julie Roybal
Environmental Impact Review Coordinator
NMED File #3551 ER

NEW MEXICO
ENVIRONMENT DEPARTMENT

*Office of the Secretary*

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DAVE MARTIN
Cabinet Secretary
BUTCH TONGATE
Deputy Secretary

November 18, 2011

Nancy Rose
Forest Supervisor, Cibola National Forest and Grasslands
2113 Osuna Road NE
Albuquerque, NM 87113

**RE: Request for information concerning the Draft Environmental Impact Statement for the Kiowa, Rita Blanca, Black Kettle, and McClellan Creek National Grasslands Land and Resource Management Plan, Mora, Harding, Union, and Colfax Counties, in New Mexico. (NMED File Number: 3551 ER)**

Dear Mrs. Rose:

Your letter regarding the above named project was received in the New Mexico Environment Department (NMED) and was sent to various Bureaus for review and comment. Comments were provided by the Surface Water Quality Bureau and are as follows.

**Surface Water Quality Bureau**
As indicated in the *Draft Environmental Impact Statement for the Kiowa, Rita Blanca, Black Kettle, and McClellan Creek National Grasslands Land and Resource Management Plan* Cibola National Forest and National Grasslands, September 2011, surface waters within and/or adjacent to the project area include portions of several perennial, intermittent, and ephemeral streams as well as wetlands resources.

According to NMAC 20.6.4, STANDARDS FOR INTERSTATE AND INTRASTATE SURFACE WATERS, hereinafter referred to as *Standards*, portions of the following Standard segments are potentially impacted by this decision:

**20.6.4.305 CANADIAN RIVER BASIN - The main stem of the Canadian river from the headwaters of Conchas reservoir upstream to the New Mexico-Colorado line.**

**20.6.4.310 CANADIAN RIVER BASIN - Perennial reaches of Corrumpa creek.**

**20.6.4.97 EPHEMERAL WATERS - Ephemeral unclassified waters of the state. as identified below and additional ephemeral waters as identified on the department's water quality standards website pursuant to Subsection C of 20.6.4.15 NMAC.**

**20.6.4.98 INTERMITTENT WATERS - All non-perennial unclassified waters of the state, except those ephemeral waters included under 20.6.4.97 NMAC.**

**20.6.4.99 PERENNIAL WATERS - All perennial unclassified waters of the state.**

Designated Uses for these Standards segments include: coldwater aquatic life, warmwater aquatic life, marginal warmwater aquatic life, irrigation, livestock watering, wildlife habitat, primary and secondary contact.

Please note "Surface water(s) of the state" are defined as *"all surface waters situated wholly or partly within or bordering upon the state, including lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, reservoirs or natural ponds. Surface waters of the state also means all tributaries of such waters, including adjacent wetlands, any manmade bodies of water that were originally created in surface waters of the state or resulted in the impoundment of surface waters of the state, and any "waters of the United States" as defined under the Clean Water Act that are not included in the preceding description."*

According to the 2010-2012 State of New Mexico CWA §303(d)/ §305(b) Integrated Report, all assessed waters within the scope of this decision currently support all designated uses.

The most recent assessment of watershed condition generated by the U.S. Department of Agriculture Forest Service, through its Watershed Condition Framework (FS-977 May 2011), and Watershed Condition Classification (WCC) Technical Guide (FS-978 July 2011) process, indicates the Outlet Sauz Creek, Canon Mestenito-Canadian River, and Perico Creek Watersheds are rated as *Fair-Functioning at Risk*. Key WCC system condition indicators for these watersheds are listed as follows:

According to the DEIS, *"Alternatives B (and C) has a desired condition for surface water features to be in properly functioning condition. The desired condition for watersheds is to manage toward a Class I watershed condition"*

The Surface Water Quality Bureau concurs with this management objective and supports efforts to restore proper function for all riparian, wetland, and watershed resources.

I hope this information is helpful to you.

Sincerely,

Julie A Roybal

Julie Roybal
Environmental Impact Review Coordinator
NMED File #3551 ER

| Watershed | Condition | Water Quality | Water Quantity | Aquatic Habitat | Aquatic Biota | Riparian Wetland Veg | Roads Trails | Soils | Fire Regime | Forest Cover | Rang e Veg | Invasive Species | Forest Health |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Outlet Sauz Creek | Functioning at Risk | Fair | Fair | Good | Good | Poor | Poor | Fair | Good | Good | Good | Good | Good |
| Canon Mestenito Canadien River | Functioning at Risk | Fair | Fair | Good | Fair | Poor | Poor | Fair | Good | Good | Good | Good | Good |
| Perico Creek | Functioning at Risk | Fair | Fair | Good | Good | Fair | Poor | Fair | Fair | Fair | Good | Good | Good |

*Oklahoma Archeological Survey*

THE UNIVERSITY OF OKLAHOMA

October 4, 2011

Champe Green
Forest Planner
Cibola National Forest
2113 Osuna Road, NE
Albuquerque, NM 87113

Re: *Draft Land and Resource Management Plan for the Kiowa, Rita Blanca, Black Kettle and McClellan Creek National Grasslands, Cibola National Forest.*

Dear Mr. Green:

I have reviewed the above referenced document pertaining to the documentation and treatment of Oklahoma's prehistoric and early historic archaeological resources. My general impression is that the land and resource management plan is primarily concerned with natural resources. In the whole draft, there are but three pages that pertain to heritage resources (pp. 27, 54, and 69) and the information presented on the three pages is minimal. As a cultural (heritage) resource manager, I think the heritage resources of the grasslands merit more attention. For example, there are hundreds of prehistoric and historic archaeological sites on the Black Kettle National Grasslands including many that hold potential significance in respect to National Register eligibility. In a fragile setting such as the grasslands eco-system, treatment and management of these resources merit some level of discussion. While it is commendable that Cibola is proposing to establish a Homestead Interpretive Site, the heritage resource base of Black Kettle is much deeper than this. The Rita Blanca NG presents a totally different situation. There has been little work done on Rita Blanca in respect to heritage resources and I do not have a firm grasp of the cultural resource base for this area. Here, some attention should be directed to the absence of knowledge concerning the composition of the heritage resources and measures developed to remedy this (surveys!).

It is my opinion that the current draft plan does not adequately address heritage resources if the goal is to manage land and resources.

This review has been conducted in cooperation with the State Historic Preservation Office, Oklahoma Historical Society.

Sincerely,

Robert L. Brooks
State Archaeologist

Cc: SHPO

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Jan. 3. 2012 4:13PM ODWC No. 2505 P. 2

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Nancy Rose
Forest Supervisor, Cibola National Forest and Grasslands
2113 Osuna Road NE
Albuquerque, NM 87113
Fax: 505-346-3901

Ms Rose:

We have reviewed the proposed Kiowa, Rita Blanca, Black Kettle, and McClellan Creek National Grasslands; Land and Resource Management Plan. Generally, the plan is consistent with our long-term management goals. We provide the following comments on certain provisions of the document.

Wind Energy Development; page 36: It appears the plan would allow wind power development on the Cibola National Grasslands. This development would be contradictory to other recreational uses such as bird watching, hunting, wildlife viewing, and cultural resource preservation. Wind development could alter wildlife habitat quality, as well as management opportunities. It could also affect a host of wildlife species. This allowance has potential to result in negative impacts on soil conservation and water quality, considering the extensive footprint required for site and access road development. Hunting could be significantly impacted because many wind power companies will not allow hunting in the vicinity of these developments.

If wind energy is allowed on National Grasslands, Lesser Prairie Chicken (LPC) habitat and potential LPC habitat should be considered higher priority when selecting site locations for wind development. Turbines should be located at least 2 miles from any occupied or potential LPC habitat. Likewise there should be no above ground transmission lines transecting LPC habitat.

Land Adjustments on page 30 of the plan appear vague. We would encourage adjustments to gain public access to parcels surrounded by private lands. Additionally, we recommend access agreements across private land for public use on parcels where land trades or purchases are not be feasible. A higher priority in the plan should be addressed to trade, buy or obtain access agreements on parcels that are not currently accessible to the public.

Part 3; Guidelines for Wildlife Habitat Improvement (page 56 for Black Kettle and page 71 for Rita Blanca) Bulleted item: language needs to be added to: "windmills should be kept running when above freezing temperature, water availability, and function permit, for wildlife benefit"; to allow cooperating agencies to operate watering facilities to provide wildlife water outside of the grazing season. Additionally there should be a requirement that all watering facilities are to be retrofitted with overflow pipes and ground level overflow ponds for wildlife use. Recent research in Texas indicates substantial use of overflow ponds by lesser prairie chickens, particularly during drought periods.

We appreciate this opportunity to provide comments to improve the Land and Resource Management Plan.

Sincerely,

Richard T. Hatcher
Director

The Oklahoma Department of Wildlife Conservation is the state agency responsible for managing fish and wildlife. The Wildlife Department recieves no general tax appropriations and is supported by hunting and fishing license fees and federal excise taxes on hunting and fishing equipment.

Jan. 3. 2012 4:12PM ODWC No. 2505 P. 1

Oklahoma Department of
Wildlife Conservation

1801 N. Lincoln Blvd.
Oklahoma City, OK 73105
(405) 521-3851

# FAX Transmittal Sheet

**Wildlife Division Office Fax (405) 521-4706**

To : Nancy Rose

Fax : 505-346-3901

From: ODWC / Wildlife Division

Date : 1-3-2012 Pages to Follow: 1

Comments: The original is in the mail. I apologize for the postmark date not being Dec 30th, bc of the holidays. Have a great day!
— Heather Dell Mcral Wildlife Secretary

# United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
1001 Indian School NW, Suite 348
Albuquerque, New Mexico 87104

TAKE PRIDE® IN AMERICA

ER 11/896
File 9043.1

December 22, 2011

Nancy Rose, Forest Supervisor
Cibola National Forest and Grasslands
2113 Osuna Road NE
Albuquerque, NM 87113

Dear Ms. Rose:

The U.S. Department of the Interior has reviewed the Draft Environmental Impact Statement (DEIS) for the Land and Resource Management Plan, Implementation for Kiowa, Rita Blanca, Black Kettle and McClellan Creek National Grassland in Colfax, Harding, Mora and Union Counties, New Mexico; Dallam, Gray and Hemphill Counties, Texas; Cimarron and Roger Mills Counties, Oklahoma, and is providing the following comments for your use as you prepare the final document.

The National Park Service National Trails Intermountain Region Office is very pleased that the Santa Fe National Historic Trail (NHT) that we administer has received explicit recognition as a special management area on the Kiowa National Grasslands (KNG). We can support either of the action alternatives (B or C), since they essentially do not differ in how cultural resources and the Santa Fe NHT are going to be managed. Of special interest to us is the proposed designation of the trail as a semiprimitive non-motorized area, and the designation of the trail at the highest scenic integrity objective of the Scenery Management System. These are critical measures for the preservation of the virtually pristine trail remains that cross the KNG for over 2 miles. We appreciate the hard work of your staff to derive what we think is a carefully crafted and balanced management plan for the KNG as you head into the next planning cycle.

If you have any questions regarding the National Park Service National Trails Intermountain Region comments, please contact Michael L. Elliott, Cultural Resource Specialist, National Trails Intermountain Region at 505-988-6092 or michael_elliott@nps.gov.

Sincerely,

Stephen R. Spencer, Ph.D.
Regional Environmental Officer

U.S. Department
of Transportation
**Federal Aviation
Administration**

Air Traffic Organization
Central Service Center

2601 Meacham Blvd.
Fort Worth, TX 76137

DEC 07 2011

Nancy Rose, Forest Supervisor
US Department of Agriculture
Forest Service
2113 Osuna Road NE
Albuquerque, NM 87113

Dear Ms. Rose:

Thank you for your letter dated September 22, 2011 addressed to Ms. Teresa Bruner regarding DEIS for proposed Kiowa, Rita Blanca, Black Kettle and McClellan Creek National Grasslands Plan. We normally participate in, and comment on, other federal agency environmental documents only from the perspective of the Federal Aviation Administration s (FAA) areas of responsibility; that is, whether the proposal will have effects on aviation and the national airspace system. We generally do not provide comments from an environmental standpoint.

From a regulatory perspective, you may need to consider if notice to FAA is required for the effect of the proposed actions on airspace. We encourage you to coordinate with the FAA's Obstruction Evaluation/Airport Airspace Analysis (OE/AAA) office so that we can review the alternatives to provide you with the possible impacts. For information on the requirements for notifying the FAA, instructions for completing the forms, or other information regarding the airspace notification process, please visit the OE/AAA web site at: https://oeaaa.faa.gov/oeaaaEXT/portal.jsp .

You will need to determine if formal notice to FAA is required for the effect of the proposal on airspace. The requirements for this notice may be found in Title 14 of the Code of Federal Regulations, Part 77, Objects Affecting Navigable Airspace. If any part of the project exceeds notification criteria under FAR Part 77, notice to the FAA is required at least 30 days prior to the proposed construction date. More information may be obtained at the OE/AAA web site.

Sincerely,

David P. Medina
Manager, Operations Support Group
ATO Central Service Center

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

REC'D USDA
REGIONAL FORESTER'S OFFICE
SOUTHWESTERN REGION
DEC 12 2011

Corbin Newman
Regional Forester
Southwestern Region
333 Broadway Blvd., SE
Albuquerque, NM 87102

EQA
Return to: RF-112

Dear Mr. Newman:

In accordance with our responsibilities under Section 309 of the Clean Air Act (CAA), the National Environmental Policy Act (NEPA), and the Council on Environmental Quality (CEQ) regulations for implementing NEPA, the U.S. Environmental Protection Agency (EPA) Region 6 office in Dallas, Texas, has completed its review of the Draft Environmental Impact Statement (DEIS) prepared by the United States Forest Service (USFS) of the United States Department of the Agriculture (USDA) for the Kiowa, Rita Blanca, Black Kettle, and McClellan Creek National Grasslands Land and Resource Management Plan, located within the states of New Mexico, Texas and Oklahoma.

Based on our analysis, EPA rates the DEIS as "**LO**" (Lack of Objections). EPA has no objection to the preferred alternative proposed by the USFS. Our only comment is as follows:

It would be beneficial if the Final EIS include the Washita Battlefield National Historic Site, located within the Black Kettle National Grassland. This site has undergone intense study and examination with regard to concerns expressed by Native Americans.

EPA appreciates the opportunity to review the DEIS. Please send our office two copies of the FEIS when it is sent to the Office of Federal Activities, EPA (Mail Code 2252A), Ariel Rios Federal Building, 1200 Pennsylvania Ave, N.W., Washington, D.C. 20004. Our classification will be published on the EPA website, www.epa.gov, according to our responsibility under Section 309 of the CAA to inform the public of our views on the proposed Federal action. If you have any questions or concerns, please contact Michael Jansky of my staff at jansky.michael@epa.gov or 214-665-7451 for assistance.

Sincerely,

Rhonda Smith
Chief, Office of Planning
and Coordination

Internet Address (URL) • http://www.epa.gov
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# Appendix B. Index of Other Supporting EIS Documentation

Below are documents that were utilized in support of the analysis process and their locations.

- Documentation of public collaboration: located in appendix I of this FPEIS
- Cibola National Forest Land and Resource Management Plan (1985) http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5277871.pdf
- Analysis of the Management Situation Supplementary Document http://www.fs.usda.gov/goto/Cibola_Grasslands_Plan_Revision_documents
- Comprehensive Evaluation Report http://www.fs.usda.gov/goto/Cibola_Grasslands_Plan_Revision_documents
- Socioeconomic Sustainability Report http://www.fs.usda.gov/goto/Cibola_Grasslands_Plan_Revision_documents
- Ecological Sustainability Report http://www.fs.usda.gov/goto/Cibola_Grasslands_Plan_Revision_documents
- Kiowa National Grassland Wilderness Evaluation Report: http://www.fs.usda.gov/goto/Cibola_Grasslands_Plan_Revision_documents_wilderness
- Suitability Analyses:
    - Timber: appendix E of this FPEIS;
    - Grazing and Recreation: appendix H of this FPEIS
- Canadian River Wild and Scenic River Evaluation: appendix C of this FPEIS.
- Research Natural Areas Evaluation: appendix D of this FPEIS.
- Viability Analysis: appendix F of this FPEIS.
- Maps: appendix L of this FPEIS.
- Specialist Reports: Available for review in the planning record, located at the Supervisor’s Office, Cibola National Forest and Grasslands, 2113 Osuna Road, NE, Albuquerque, NM 87113.

# Appendix C. The Canadian River Wild and Scenic River Evaluation

## Summary of Eligibility Analysis
## Cibola National Forest

**River Segment:** Canadian River
**From:** North Boundary of K135
**To:** Southern Tip of K136
**Evaluated By:** Jimmy Hall, Peter Gaulke, Karen Carter, Liz Agpaoa, Flor Martinez
**Date:** 11/01/01

| **I. ELIGIBILITY ANALYSIS** | NO | YES |
|---|---|---|
| A. Free – Flowing<br>Existing or flowing in a natural condition without impoundment, diversion, straightening, riprapping, or other modification of the waterway. The existence of low dams, diversion works or other minor structures does not automatically disqualify the segment for designation. A river segment below or between impoundments may also be considered.<br><br>Free-flowing in this section. On rare climatic conditions it does slow down to a trickle or dry. Such is the case in the fall of 2001. | ☐ | X |
| B. Scenery<br>Do the landscape elements of landform, vegetation, water, color, and related factors result in notable or exemplary visual features or attractions? (When analyzing scenic values, additional factors—such as seasonal variations in vegetation, scale of cultural modifications, and the length of time negative intrusions are viewed—may be considered. Scenery and visual attractions may be highly diverse over the majority of the river or river segment.)<br><br>Very unique for the region. Fall colors occur occasionally. Scenery is viewed by visitors as beautiful, primitive, and natural. Fall color viewing is unlike anything else in the surrounding area. | ☐ | X |
| C. Recreation<br>• Are recreational opportunities popular enough or have the potential to be popular enough to attract visitors from throughout the region of comparison? (River related opportunities could include, but are not limited to, sightseeing, wildlife observations, camping, photography, hiking, fishing, hunting, and boating. Visitors are willing to travel long distances to use the river resources for recreational purposes.) | ☐ | X |

| | | |
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| • Are recreational opportunities unique or rare within the region?<br>• Are interpretive opportunities exceptional or have the potential to attract visitors from outside the region of comparison?<br>• Does the river provide or have the potential to provide settings for national or regional usage or competitive events?<br><br>Destination recreation opportunities include bird watching, barbary sheep and deer hunting, camping, fishing, and photography. There are numerous areas for interpretive opportunities. | | |
| D. <u>Geology</u><br>• Does the river or river corridor contain one or more example(s) of a geologic feature, process or phenomenon unique or rare within the region of comparison? (The feature(s) may be in an unusually active stage or development, represent a "textbook" example, and/or represent a unique or rare combination of geologic features—erosional, volcanic, glacial or other geologic structures.)<br><br>There are five different geologic formations in the Canadian River Canyon. | ☐ | **X** |
| E. <u>Fish</u><br><u>(Fish values may be judged on the relative merits of either fish populations, habitat, or a combination of these conditions.)</u><br>• Is the river a nationally or regionally important producer of resident and/or anadromous fish species? (Of particular significance is the presence of wild stocks and/or Federal or state listed (or candidate) threatened, endangered or sensitive species. Diversity of species is an important consideration and could, in itself, lead to a determination of "outstandingly remarkable.")<br>• Does the river provide exceptionally high quality habitat for fish species indigenous to the region of comparison? (Of particular significance is habitat for wild stocks and/or Federal or state listed (or candidate) threatened, endangered or sensitive species. Diversity of habitats is an important consideration and could, in itself, lead to a determination of "outstandingly remarkable.")<br><br>Warm water fisheries that include catfish. Possibly other species migrating, but unknown. This section is not considered good or pristine fish habitat. | **X** | ☐ |
| F. <u>Wildlife</u><br><u>(Wildlife values may be judged on the relative merits of either terrestrial or aquatic populations, habitat or a combination of these conditions.)</u><br>• Does the river or river corridor contain nationally or regionally important populations of indigenous wildlife species? (Of particular significance are species considered to be unique, and/or populations of Federal or state listed (or candidate) threatened, | **X** | ☐ |

| | | |
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| endangered or sensitive species. Diversity of species is an important consideration and could, in itself, lead to a determination of "outstandingly remarkable.")<br>• Does the river or river corridor provide exceptionally high quality habitat for wildlife of national or regional significance, and/or may provide a critical link in habitat conditions for Federal or state listed (or candidate) threatened, endangered or sensitive species? (Diversity of habitats is an important consideration and could, in itself, lead to a determination of "outstandingly remarkable.")<br><br>Deer, turkey, Barbary sheep, mountain lion, black bears, coyotes, and bobcats are all present. Habitat is a cross section for these species, but not a showcase area for important wildlife populations. | | |
| G. <u>History</u><br>• Does the river or river corridor contain a site(s) or feature(s) associated with a significant event, an important person, or a cultural activity of the past that was rare or one-of-a-kind in the region? (Many such sites are listed on the National Register of Historic Places. A historic site(s) and/or feature is 50 years old or older in most cases.)<br><br>Melvin Mills came from the Midwest to Elizabeth Town and set up a law business – he became involved in the Maxwell Land Grant. He was involved in Colfax County Range War. His father homesteaded in 1875 along the river and developed it and established an orchard. Had stagecoach line coming in from Kansas. | ☐ | **X** |
| H. <u>Cultural Values</u><br>• Does the river or river corridor contain a site(s) where there is evidence of occupation or use by Native Americans with unique or rare characteristics or exceptional human interest value(s)?<br>• Are sites nationally or regionally important for interpreting prehistory, rare and represent an area where a culture or cultural period was first identified and described, used concurrently by two or more cultural groups, and/or used by cultural groups for sacred purposes? (Many such sites are listed on the National Register of Historic Places.)<br><br>Native American campsites are in the area, but this is not unique to the Canadian River valley. They are found in many locations in this region. | **X** | ☐ |
| I. <u>Vegetative /Ecological Values</u><br>(Vegetative and ecological values may be judged on the relative merits of either populations or communities, or a combination of these conditions.)<br>• Does the river or river corridor contain nationally or regionally important populations of indigenous plant species? (Of | **X** | ☐ |

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| importance are species considered to be unique or populations of Federal or state listed or candidate threatened, endangered, or sensitive species. Diversity and number of species are also important.)<br>• Does the river or river corridor contain nationally or regionally important plant communities? (Communities are exceptionally high quality, unusual or critical communities such as old-growth.)<br><br>Vegetation is common to this climate/elevation. | | |
| J. Other Similar Values<br>Consider values such as (but not limited to) hydrology, water quality, or traditional cultural use. Include criteria.<br><br>Criteria for Traditional Cultural Use:<br>• Does the river or river corridor contain regionally unique location(s) or importance to Native American tribes, land grant communities, and/or other traditional Hispanic users. (Locations may be important for religious activities, fishing, hunting, gathering or similar activities. Locations may have unusual characteristics, exceptional cultural value, or be integral to the continued pursuit of such activities.)<br><br>*Nothing unique.* | **X** | ☐ |

II. **ANALYSIS OF ELIGIBILITY COMPONENTS**

Item I.A. and one or more other items above are checked "YES": River area is eligible for designation.

**Creek is Eligible: Segment is free flowing and has the following outstandingly remarkable values: scenery, recreation, geology, and history.**

**Classification is Scenic: River segment is accessible by road and has one developed campground, old orchard, stone structures, and rock fences.**

# Appendix D. Research Natural Area Evaluations

## Potential Research Natural Areas

A review and analysis of vegetation types that occur on the Grasslands which are underrepresented at the landscape scale of the southern Great Plains was conducted to determine their potential for designation as research natural areas. The information provided in this appendix documents the rationale behind the conclusion that these underrepresented vegetation types do not meet the criteria for designation, based upon guidance in FSM 4063.02 and 4063.03. Thus, no further plan direction beyond that given at the Grasslands-wide, management area, and special area scale is given for these areas.

The planning process allows for future proposals of RNAs by amendment during the life of the plan if the ecological condition of a unit improves to the point where RNA recommendation criteria are met.

**RNA Evaluation: Review of Representative Ecological Conditions**

| Black Kettle and McClellan Creek National Grasslands<br>Shinnery Oak Vegetation Type Ranked as 3, Very Underrepresented | | | |
|---|---|---|---|
| **STEP** | **Criteria** | **YES (state justification)** | **NO (state justification)** |
| 1 | Review Research Natural Area (RNA) Representative Assessment spreadsheet.<br><br>Are there areas on your forest that contain the potential natural vegetation type (vegetation type) classes that fall into the 2 or 3 rankings for low representation for a particular vegetation type class?<br><br>Is there an outstanding example of an aquatic habitat that may be appropriate as a potential RNA?<br><br>If you have previously proposed RNAs in your current forest plan, do they fall within vegetation type classes with rankings of 2 or 3? | YES<br><br>NO<br><br>NA | |
| 2 | Use the conditions listed below to determine if these low representative vegetation type class areas or aquatic habitats are appropriate for RNA establishment. | State reason why the area meets the criterion. | State reason why the area does not meet the criterion. |
| | Area contributes to a wide spectrum of high quality representative areas that represent the major forms of variability found in forest, shrubland, grassland, alpine, and aquatic habitats, and natural situations of scientific interest and importance that, in combination, form a national network of ecological areas for research, education, and maintenance of biological diversity. RNA represents a specific vegetation type or ecosystem as identified by the regional ecological RNA evaluation. | | No areas are appropriate for RNA establishment for the following reasons: Areas of shinnery oak are small, fragmented, and not intact. Various degrees of human disturbance, some of which are unknown in context of timing, intensity, and duration have occurred. Spike herbicide has been applied to many areas of shinnery oak in the past. Fire history of shinnery oak areas is unknown except for the past 15 |

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| | | | years. At least 55 years of grazing have occurred on shinnery oak areas, some under management, some not. Grazing history preceding government ownership is largely unknown and poorly documented. Open range grazing policy prevailed during that time, and some land was under private ownership. |
| | Area contributes or continues to contribute to the preservation and maintenance of genetic diversity, including threatened species, endangered species, aquatic systems, and sensitive species. | | Grasshopper Sparrow is the only sensitive species, and it is not listed and is a migrant. We are not aware of any analysis of genetic diversity, thus cannot address genetic diversity of vegetation or wildlife. Additionally, there is much variability in soil types and vegetation response to soil conditions. |
| | Area serves as a baseline or reference area for the study of long-term ecological processes such as disturbance, hydrologic processes, climate change, or other processes. | | No, areas within this vegetation type are not good baseline or reference areas for study. Individual shinnery oak areas are small in size, and even cumulatively, too small a scale. Too much variability has occurred in management history. Too much human disturbance has occurred. Black locust has colonized within the shinnery oak areas. Open swine grazing is part of the history of these areas. |
| | Area serves as a control area for comparing results from manipulative research. | | No, areas not suitable for control. Past fire regimes are largely unknown and variable grazing management has occurred, some of which are unknown. Past human disturbance is unknown and not well documented before Federal ownership. |
| | Area boundaries encompass an area large enough to provide essentially unmodified conditions within their interiors, which are necessary in accordance with the objectives stated in the establishment record (FSM 4063.02), and to protect the ecological processes, features, and/or qualities for which the RNA was established.<br>Although not required, entire small drainages are ideal because they maintain interrelationships of terrestrial and aquatic systems. | | No, areas are not large enough to provide conditions immune to edge effects or outside influences. Areas are highly fragmented. The Black Kettle and McClellan Creek National Grasslands (BKMC) do not own entire drainages where areas within this vegetation type occur. |

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| | Area shows little or no evidence of major disturbances by humans. Activities, such as livestock grazing and other uses, have not affected the area beyond its ability to recover. No evidence of timber cutting in past 50 years. | | No, areas show much evidence of major disturbance by humans. Areas evolved under grazing. Some firewood cutting has occurred. |
| | Area reflects its original, near pristine condition as closely as possible. | | No, areas are not original or pristine, for all reasons stated above. |
| | The best available, qualified area was chosen. In certain geographic regions and in certain community types, it may be impossible to find candidate areas that do not contain exotic plant or animal life. | | Not applicable, no areas are chosen for recommendation. |
| **Black Kettle and McClellan Creek National Grasslands<br>Mixed-grass Prairie Vegetation Type: Ranked as 3, Very Underrepresented** | | | |
| **STEP** | **Criteria** | **YES (state justification)** | **NO (state justification)** |
| 1 | Review RNA Representative Assessment spreadsheet<br>Are there areas on your forest that contain the vegetation type classes that fall into the 2 or 3 rankings for low representation for a particular vegetation type class? | YES | |
| | Is there an outstanding example of an aquatic habitat that may be appropriate as a potential RNA? | NO | |
| | If you have previously proposed RNAs in your current forest plan, do they fall within vegetation type classes with rankings of 2 or 3? | NA | |
| 2 | Use the conditions listed below to determine if these low representative vegetation type class areas or aquatic habitats are appropriate for RNA establishment. | State reason why the area meets the criterion. | State reason why the area does not meet the criterion. |
| | Area contributes to a wide spectrum of high quality representative areas that represent the major forms of variability found in forest, shrubland, grassland, alpine, and aquatic habitats, and natural situations of scientific interest and importance that, in combination, form a national network of ecological areas for research, education, and maintenance of biological diversity. RNA represents a specific vegetation type or ecosystem as identified by the regional ecological RNA evaluation. | | No. Essentially same points as for shinnery oak above, for all criteria below. Additionally, more plowing occurred in mixed-grass vegetation type than in shinnery oak. About half of mixed-grass was plowed. Soil loss occurred during Dust Bowl era, mainly from plowing. Some mixed-grass was once shinnery oak, but now no shinnery oak occurs in these areas. |

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| | Area contributes or continues to contribute to the preservation and maintenance of genetic diversity, including threatened species, endangered species, aquatic systems, and sensitive species. | | |
| | Area serves as a baseline or reference area for the study of long-term ecological processes such as disturbance, hydrologic processes, climate change, or other processes. | | |
| | Area serves as a control area for comparing results from manipulative research. | | |
| | Area boundaries encompass an area large enough to provide essentially unmodified conditions within their interiors, which are necessary in accordance with the objectives stated in the establishment record (FSM 4063.02), and to protect the ecological processes, features, and/or qualities for which the RNA was established.<br>Although not required, entire small drainages are ideal because they maintain interrelationships of terrestrial and aquatic systems. | | |
| | Area shows little or no evidence of major disturbances by humans. Activities, such as livestock grazing and other uses, have not affected the area beyond its ability to recover. No evidence of timber cutting in past 50 years. | | |
| | Area reflects its original, near pristine condition as closely as possible. | | |
| | The best available, qualified area was chosen. In certain geographic regions and in certain community types, it may be impossible to find candidate areas that do not contain exotic plant or animal life. | | NA. Not recommended for establishment. |
| **Kiowa and Rita Blanca National Grasslands<br>Cottonwood-Willow/Riparian Vegetation Type: Ranked as 3, Very Underrepresented** | | | |
| **STEP** | **Criteria** | **YES (state justification)** | **NO (state justification)** |
| 1 | Review RNA Representative Assessment spreadsheet<br>Are there areas on your forest that contain the vegetation type classes that fall into the 2 or 3 rankings for low representation for a | YES | |

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| | particular vegetation type class?<br>Is there an outstanding example of an aquatic habitat that may be appropriate as a potential RNA? | NO | |
| | If you have previously proposed RNAs in your current forest plan, do they fall within vegetation type classes with rankings of 2 or 3? | NA | |
| 2 | Use the conditions listed below to determine if these low representative vegetation type class areas or aquatic habitats are appropriate for RNA establishment. | State reason why the area meets the criterion. | State reason why the area does not meet the criterion. |
| | Area contributes to a wide spectrum of high quality representative areas that represent the major forms of variability found in forest, shrubland, grassland, alpine, and aquatic habitats, and natural situations of scientific interest and importance that in combination form a national network of ecological areas for research, education, and maintenance of biological diversity. RNA represents a specific vegetation type or ecosystem as identified by the regional ecological RNA evaluation. | | No. Impacts of past grazing are evident in the cottonwood-willow (CW) vegetation type. Also, impacts of hydrologic alteration (acequias, irrigation diversions at Springer, NM) are evident. Invasive species are evident, and some noxious plants (e.g., saltcedar, bull thistle, musk thistle, and American or Siberian elm) occur. Changes in watershed, some off-Grasslands, have caused changes in the hydrologic regime. |
| | Area contributes or continues to contribute to the preservation and maintenance of genetic diversity, including threatened species, endangered species, aquatic systems, and sensitive species. | | No. There are no threatened and endangered species (T&E) present. Little is known about genetic diversity of most all species. Some sensitive species do occur; the Conchas crayfish, which likely occurs in Mills Canyon, may be one of three known populations in the state. |
| | Area serves as a baseline or reference area for the study of long-term ecological processes such as disturbance, hydrologic processes, climate change, or other processes. | | No. There is a long history of human disturbance within the CW vegetation type Grasslands-wide; it is very impacted. U.S. Forest Service (USFS) has no control over management and processes occurring above Mills Canyon. The hydrologic system is very impacted. |
| | Area serves as a control area for comparing results from manipulative research. | | No. Areas within CW vegetation type are not suitable as reference or baseline areas. Treatment of invasive species is ongoing. |

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| | Area boundaries encompass an area large enough to provide essentially unmodified conditions within their interiors, which are necessary in accordance with the objectives stated in the establishment record (FSM 4063.02), and to protect the ecological processes, features, and/or qualities for which the RNA was established.<br>Although not required, entire small drainages are ideal because they maintain interrelationships of terrestrial and aquatic systems. | | No. Areas are not large enough to provide unmodified conditions. USFS controls only 17 miles out of 290 miles of the Canadian River and an even smaller percentage of the watershed. |
| | Area shows little or no evidence of major disturbances by humans. Activities, such as livestock grazing and other uses, have not affected the area beyond its ability to recover. No evidence of timber cutting in past 50 years. | | No. Areas have experienced much disturbance. Roads, trails, livestock grazing, modification for irrigation, campgrounds, and housing structures are present or have occurred in all areas within this vegetation type. Perico Creek also has CW, but Federal ownership of this creek basin is fragmented and small. |
| | Area reflects its original, near pristine condition as closely as possible. | | No. Areas within CW vegetation type are not in original or pristine condition. |
| | The best available, qualified area was chosen. In certain geographic regions and in certain community types, it may be impossible to find candidate areas that do not contain exotic plant or animal life. | | NA. Not recommended for establishment. |
| **Kiowa and Rita Blanca National Grasslands<br>Shortgrass Vegetation Type: Ranked as 2, Underrepresented** | | | |
| **STEP** | **Criteria** | **YES (state justification)** | **NO (state justification)** |
| 1 | Review RNA Representative Assessment spreadsheet.<br>Are there areas on your forest that contain the vegetation type classes that fall into the 2 or 3 rankings for low representation for a particular vegetation type class?<br>Is there an outstanding example of an aquatic habitat that may be appropriate as a potential RNA?<br>If you have previously proposed RNAs in your current forest plan, do they fall within vegetation type classes with rankings of 2 or 3? | YES<br>NO<br>YES. Unit 46 was previously proposed in 1985 plan but not designated. Subsequently, USFS Rocky Mountain Research Station launched a fire and grazing study circa 1997 on the | |

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| | | previously proposed area, with another 8 to 9 years anticipated before completion. Because of the considerable burning and grazing interventions as parts of the study, RNA designation would interfere with this RMRS study. | |
| 2 | Use the conditions listed below to determine if these low representative vegetation type class areas or aquatic habitats are appropriate for RNA establishment. | State reason why the area meets the criterion. | State reason why the area does not meet the criterion. |
| | Area contributes to a wide spectrum of high quality representative areas that represent the major forms of variability found in forest, shrubland, grassland, alpine, and aquatic habitats, and natural situations of scientific interest and importance that in combination form a national network of ecological areas for research, education, and maintenance of biological diversity. RNA represents a specific vegetation type or ecosystem as identified by the regional ecological RNA evaluation. | | No. Areas within this vegetation type do not meet criteria. Many past disturbances have occurred, many of which are undocumented and unknown regarding timing, intensity, and duration. There has been varying grazing history over 55 years of Federal ownership. Some areas were plowed, some were not, and all were grazed. No natural fire was allowed due to suppression policy. Grazing has been the biggest impact. Historical stocking rates are unknown. Areas have been highly modified with fences, water developments, roads, and utility corridors. Playa lakes have been highly altered, i.e., pitted, or modified by irrigation structures. |
| | Area contributes or continues to contribute to the preservation and maintenance of genetic diversity, including threatened species, endangered species, aquatic systems, and sensitive species. | | No. Past Grassland reclamation projects (i.e., plantings and seedings) may not have been genetically compatible with historical strains of native plants. Exotic species are currently present, and there is a varied history of livestock grazing and management. No T&E species are present. Ten rare or uncommon species (alpine fever-few, Andean prairie-clover, Bald Eagle, dotted checkerspot, Greene milkweed, Mountain Plover, one-flowered milkvetch, Rhena crossline skipper, Spellenberg's groundsel, swift fox) may occur on |

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| | | | shortgrass vegetation type areas within KRB NGs, but current management activities consider and avoid/mitigate adverse effects on these species through project NEPA. |
| | Area serves as a baseline or reference area for the study of long-term ecological processes such as disturbance, hydrologic processes, climate change, or other processes. | | No. Only a large-scale playa complex within this vegetation type would qualify as reference, but playas are dynamic in size, ephemeral in nature, and have been altered by pitting and other management activities on the landscape both on and off Federal land. Playas are often located in small land blocks of Federal ownership that are highly fragmented; they are also intermingled within shortgrass prairie that has also been altered. In general, playas are too small and fragmented and otherwise altered to be considered. |
| | Area serves as a control area for comparing results from manipulative research. | | No. Too much historical disturbance and alteration to serve as a control area. |
| | Area boundaries encompass an area large enough to provide essentially unmodified conditions within their interiors, which are necessary in accordance with the objectives stated in the establishment record (FSM 4063.02), and to protect the ecological processes, features, and/or qualities for which the RNA was established.<br>Although not required, entire small drainages are ideal because they maintain interrelationships of terrestrial and aquatic systems. | | No. Areas within vegetation type are too fragmented, occur in small blocks, and are significantly altered. |
| | Area shows little or no evidence of major disturbances by humans. Activities such as livestock grazing and other uses have not affected the area beyond its ability to recover. No evidence of timber cutting in past 50 years. | | No. Much disturbance has occurred (see above); many disturbance activities occurred before Federal ownership and are undocumented. |
| | Area reflects its original, near pristine condition as closely as possible. | | No. Much disturbance has occurred (see above). |
| | The best available, qualified area was chosen. In certain geographic regions and in certain community types, it may be impossible to find candidate areas that do not contain exotic plant or animal life. | | NA. Not recommended for establishment. |

| Kiowa and Rita Blanca National Grasslands<br>Sand Sagebrush Vegetation Type. Ranked as 3, Very Underrepresented | | | |
|---|---|---|---|
| **STEP** | **Criteria** | **YES (state justification)** | **NO (state justification)** |
| 1 | Review RNA Representative Assessment Spreadsheet.<br><br>Are there areas on your forest that contain the vegetation type classes that fall into the 2 or 3 rankings for low representation for a particular vegetation type class?<br><br>Is there an outstanding example of an aquatic habitat that may be appropriate as a potential RNA?<br><br>If you have previously proposed RNAs in your current forest plan, do they fall within vegetation type classes with rankings of 2 or 3? | YES (but sand sagebrush vegetation type is even more disturbed than shortgrass vegetation type discussed above)<br><br>NO<br><br>NA | |
| 2 | Use the conditions listed below to determine if these low representative vegetation type class areas or aquatic habitats are appropriate for RNA establishment. | State reason why the area meets the criterion. | State reason why the area does not meet the criterion. |
| | Area contributes to a wide spectrum of high quality representative areas that represent the major forms of variability found in forest, shrubland, grassland, alpine, and aquatic habitats, and natural situations of scientific interest and importance that in combination form a national network of ecological areas for research, education, and maintenance of biological diversity. RNA represents a specific vegetation type or ecosystem as identified by the regional ecological RNA evaluation. | | No. There are many exotic species. There is a plant diversity imbalance. Natural fire has been removed. Topsoil has been lost due to disturbances. Many previous agricultural disturbances have occurred. One would have a hard time finding sand sagebrush that represents a pristine ecological condition. Yucca is present disproportionately. Sage is at a higher density than historically occurred. Forbs and buckwheat presence are out of balance. Big bluestem and needlegrass should be more highly represented. There is an overall imbalance in the plant community. |
| | Area contributes or continues to contribute to the preservation and maintenance of genetic diversity, including threatened species, endangered species, aquatic systems, and sensitive species. | | No. Areas within vegetation type are not genetically or ecologically in balance. No T&E species are present. Rare or uncommon species that may occur in sand sagebrush vegetation type include panhandle spurge, dotted checkerspot, Rhena crossline skipper, and Lesser Prairie-chicken. Current and future management activities consider and avoid/mitigate adverse effects |

| | | | |
|---|---|---|---|
| | | | on these species through project NEPA. |
| | Area serves as a baseline or reference area for the study of long-term ecological processes such as disturbance, hydrologic processes, climate change, or other processes. | | No. Areas not appropriate for reference or baseline areas for reasons stated above. |
| | Area serves as a control area for comparing results from manipulative research. | | No. Areas are not appropriate for a control area for reasons stated above. |
| | Area boundaries encompass an area large enough to provide essentially unmodified conditions within their interiors, which are necessary in accordance with the objectives stated in the establishment record (FSM 4063.02), and to protect the ecological processes, features, and/or qualities for which the RNA was established.<br>Although not required, entire small drainages are ideal because they maintain interrelationships of terrestrial and aquatic system | | No. Areas with this vegetation type are too fragmented and remnant systems are not large enough. |
| | Area shows little or no evidence of major disturbances by humans. Activities, such as livestock grazing and other uses, have not affected the area beyond ability to recover. No evidence of timber cutting in past 50 years. | | No. Areas within vegetation type are highly disturbed historically, as noted above. |
| | Area reflects its original, near pristine condition as closely as possible. | | No. Areas within vegetation type are not in original or pristine condition. |
| | The best available, qualified area was chosen. In certain geographic regions and in certain community types, it may be impossible to find candidate areas that do not contain exotic plant or animal life. | | NA. Not recommended for establishment. |
| **Kiowa and Rita Blanca National Grasslands<br>Pinyon-Juniper Vegetation Type: Ranked 2, Underrepresented** | | | |
| **STEP** | **Criteria** | **YES (state justification)** | **NO (state justification)** |
| 1 | Review RNA Representative Assessment spreadsheet.<br>Are there areas on your forest that contain the vegetation type classes that fall into the 2 or 3 rankings for low representation for a particular vegetation type class? | YES<br>NO | |

| | | | |
|---|---|---|---|
| | Is there an outstanding example of an aquatic habitat that may be appropriate as a potential RNA?<br>If you have previously proposed RNAs in your current forest plan, do they fall within vegetation type classes with rankings of 2 or 3? | NA | |
| 2 | Use the conditions listed below to determine if these low representative vegetation type class areas or aquatic habitats are appropriate for RNA establishment. | State reason why the area meets the criterion. | State reason why the area does not meet the criterion. |
| | Area contributes to a wide spectrum of high quality representative areas that represent the major forms of variability found in forest, shrubland, grassland, alpine, and aquatic habitats, and natural situations of scientific interest and importance that in combination form a national network of ecological areas for research, education, and maintenance of biological diversity. RNA represents a specific vegetation type or ecosystem as identified by the regional ecological RNA evaluation. | | No. Areas of pinyon-juniper (PJ) vegetation type are not high quality, and the scale of their presence is not large enough to be considered. |
| | Area contributes or continues to contribute to the preservation and maintenance of genetic diversity, including threatened species, endangered species, aquatic systems, and sensitive species. | | No. T&E species are less prevalent in PJ areas than in any other vegetation type present on Kiowa National Grassland. |
| | Area serves as a baseline or reference area for the study of long-term ecological processes such as disturbance, hydrologic processes, climate change, or other processes. | | No. Areas with PJ vegetation type are not appropriate for baseline or reference. There have been long-term grazing disturbances, as well as roads and infrastructure construction. Many PJ lands on Kiowa NG were originally settlement lands grazed by sheep and goats. |
| | Area serves as a control area for comparing results from manipulative research. | | No. Areas within the PJ vegetation type are not appropriate to serve as a control area. All land within PJ vegetation type have been previously impacted (see above). |

| | | | |
|---|---|---|---|
| | Area boundaries encompass an area large enough to provide essentially unmodified conditions within their interiors, which are necessary in accordance with the objectives stated in the establishment record (FSM 4063.02), and to protect the ecological processes, features, and/or qualities for which the RNA was established.<br>Although not required, entire small drainages are ideal because they maintain interrelationships of terrestrial and aquatic systems. | | No. Areas are not large enough. The scale of PJ areas is too small to be considered as an RNA. Fragmented Federal land ownership and administration boundaries within this vegetation type are not compatible with RNA recommendation. |
| | Area shows little or no evidence of major disturbances by humans. Activities, such as livestock grazing and other uses, have not affected the area beyond ability to recover. No evidence of timber cutting in past 50 years. | | No. Areas of PJ show lots of evidence of major disturbances over the last 100 years, including wood cutting (huge stumps are still present). |
| | Area reflects its original, near pristine condition as closely as possible. | | No. See above. |
| | The best available, qualified area was chosen. In certain geographic regions and in certain community types, it may be impossible to find candidate areas that do not contain exotic plant or animal life. | | NA. Not recommended for establishment. |

Completed May 27, 2009, over audio-video conference: Cibola NF&NGs employees: Nancy Walls, Tom Smeltzer, Champe Green, Susan Millsap, Mary Lane, Chuck Milner, and John Baumchen.

# Appendix E. Timber Suitability

The National Forest Management Act (NFMA) of 1976 requires that National Forest System (NFS) lands be classified as to their suitability for various uses including timber harvest and timber production. NFS lands were reserved with the intent of providing goods and services to satisfy public needs over the long term, among them is a sustainable supply of forest products.

The 1982 Rule Provisions Section 219.14, require the responsible official to identify lands not suitable for timber production within the plan area. Based upon the definition of "forest land" 1982 Rule Provisions Section 219.14 (a)(1)) and other criteria for determining suitability of forest land (FSH 2409.13, Chapter 20) all land on the Grasslands is considered unsuitable for commercial timber production.

Five criteria were used to evaluate lands on the Grasslands to tentatively determine whether they were suitable for commercial timber management. The first criterion considers whether the land is forested or not. Section 219.3 of the 1982 Rule Provisions defines land that is forested as: At least 10 percent occupied by forest trees of any size or formerly having had such tree cover, and not currently developed for nonforest use. Lands classified as developed for nonforest use include areas for crops, improved pasture, residential, or administrative areas, improved roads of any width and adjoining road clearing and power line of any width.

The second evaluative criterion is: Is the land already withdrawn from timber production? Withdrawn lands are usually areas specifically chosen for protection or special status and are precluded from timber production. Examples are wilderness and research natural areas.

The third criterion asks: Is the land capable of producing commercially usable wood? If not, the primary condition for assigning lands to this category is that the species of trees involved is not currently utilized, nor likely to be utilized commercially within the next 10 years. This does not preclude developing alternative management opportunities should a demand develop.

On the fourth criterion, 1982 Rule Provisions Section 219.14(a)(2) states: Technology is not available to ensure timber production from the land without irreversible resource damage to soils productivity or watershed conditions. In this case soils may be damaged by erosion, nutrient removal, compaction, and mass movement (landslides). Forested lands within riparian areas are included because wet soils are especially sensitive and important for functioning of the ecosystem.

The fifth criterion used to identify lands suitable for timber production addresses reforestation and restocking of forested land. Is there reasonable assurance of adequate restocking within 5 years after final harvest? Final harvest is defined in 1982 Rule Provisions Section 219.14(a)(2) as "clear-cutting, final overstory removal in shelterwood cutting, and seed tree removal cut in seed tree cutting and selection cutting." Generally this includes soil mapping units exhibiting shallow and some moderately deep soils.

Timber suitability classification and area descriptions are summarized in tables 1 and 2.

**Table 1. Black Kettle and McClellan Creek timber suitability classification and area descriptions**

| Category | Description | Acres |
|---|---|---|
| **Total NFS Lands (Forest or Grassland)** | | **32,735** |
| **Non-forested land (not suitable for timber production)** | **<10% occupied by trees** | **31,105** |
| **Forested land—not suitable for timber production because:** | | |
| Withdrawn from timber production | | 0 |
| Irreversible resource damage likely | Soils may be damaged by erosion or nutrient removal | 779 |
| Adequate restocking not assured | | 0 |
| **Forested land *tentatively* suitable for timber production** (all forested land minus sum of 3 rows above) | | 851 |
| **Forested land tentatively suitable for timber production—not *appropriate* for timber production because:** | | |
| Forested lands where resource management prescriptions preclude timber production | | 0 |
| Forested lands where management objectives limit timber harvest | | 0 |
| Forested lands that are not economically cost efficient | Shelterbelt and riparian woodland, not capable of producing crops of commercial wood | 851 |
| **Forested—lands not appropriate for timber production** (sum of 3 rows above) | | **851** |
| **Forested—lands suitable for timber production** | | **0** |
| **Lands not suitable for timber production** (not suitable or appropriate for timber production) | | **32,735** |

Adapted from "Determination of Tentatively Suitable Timber Lands on the Cibola National Forest and the Kiowa, Rita Blanca, Black Kettle, and McClellan Creek National Grasslands;" Paul Tidwell, silviculturist, Cibola National Forest, December 4, 1998. Updated to reflect current acreages.

**Table 2. Kiowa and Rita Blanca National Grasslands timber suitability classification and area descriptions**

| Category | Description | Acres |
|---|---|---|
| **Total NFS Lands (Forest or Grassland)** | | **230,526** |
| **Non-forested land (not suitable for timber production)** | <10% occupied by trees | 221,458 |
| Forested land—not suitable for timber production because: | | |
| Withdrawn from timber production | | 0 |
| Irreversible resource damage likely | | 0 |
| Adequate restocking not assured | | 0 |
| **Forested land *tentatively* suitable for timber production** (all forested land minus sum of 3 rows above) | | **9,068** |
| **Forested land tentatively suitable for timber production—not *appropriate* for timber production because:** | | |
| Forested lands where resource management prescriptions preclude timber production | | 0 |
| Forested lands where management objectives limit timber harvest | | 0 |
| Forested lands that are not economically cost efficient | Pinyon-juniper and riparian woodland, not capable of producing crops of commercial wood | 9,068 |
| **Forested—lands not appropriate for timber production** (sum of 3 rows above) | | **9,068** |
| **Forested—lands suitable for timber production** | | **0** |
| **Lands not suitable for timber production** (not suitable or appropriate for timber production) | | **230,526** |

Adapted from "Determination of Tentatively Suitable Timber Lands on the Cibola National Forest and the Kiowa, Rita Blanca, Black Kettle, and McClellan Creek National Grasslands;" Paul Tidwell, silviculturist, Cibola National Forest, December 4, 1998. Updated to reflect current acreages.

# Appendix F. Coarse Filter/Fine Filter and Viability Evaluations

## Viability and Biological Evaluation for Kiowa, Rita Blanca, Black Kettle, and McClellan Creek National Grasslands

### Process Criteria used for Determining Species Viability on the National Grasslands

### 1. Description of the Ecological Context

The determination of ecological sustainability and species viability on the national grasslands (NGs) is a culmination of assessing ecosystem characteristics (including vegetation type, soil, water, and air) departure from the reference condition (appendix F in "Ecological Sustainability Report" (ESR), see Web address provided in appendix B of this FPEIS).

The ESR evaluated the ecological systems of the Kiowa and Rita Blanca (KRB) and Black Kettle (BK), and McClellan Creek (MC) NGs (herein collectively referred to as the "Grasslands") and the relationship to the surrounding area (ESR). The ESR has two main sections—ecosystem diversity and species diversity. The "Ecosystem Diversity" section discusses conditions and trends in the vegetation communities and physical resources based on the reference condition of the vegetation types. Appendix F of the ESR supplements the information found in the "Ecosystem Diversity" section of the ESR. Specifically, it outlines the current and historical conditions for shortgrass prairie, pinyon-juniper, cottonwood-willow riparian, sand sagebrush, mixed-grass prairie, shinnery oak, and mixed hardwood riparian vegetation types. The species diversity section looks at species found in Texas, New Mexico, and Oklahoma on the Grasslands and are affected by Grasslands management. Population or habitat concerns for the identified species were analyzed and viability risks determined.

The condition and trends in the Grasslands vegetation communities are evaluated on a 5- to 10-year interval using field reconnaissance, visual obstruction readings, Parker 3 Step transects,[1] cover-frequency transects, production clippings, photo points, and composition inventories. Data collected has been compared with historical data and with the terrestrial ecological unit inventory.[2]

In order to determine the departure for a vegetation type, the mid-scale[3] vegetation found within each vegetation type was placed into one of three classes based on the information in the reference condition model. A comparison was made of the current percentage to the historical percentage for each class within the model. The lesser of the two percentages (current vs.

[1] Ruyle, G., & Dyess, J. (2010). Rangeland Monitoring and the Parker 3-Step Method: Overview, Perspectives and current Appllications. Tucson AZ: The University of Arizona Cooperative Extension.

[2] Terrestrial ecosystem unit inventory consists of mapping and interpreting ecosystems through a systematic examination, description, classification, and integration of the soil, vegetation, and climate on national forest and grasslands. Mid-scale vegetation type description is structural, not compositional. Description of existing species composition was inferred by relating remotely sensed data (mid-scale) to ground-based data (TEUI). Comparison of existing vegetation to reference condition is, therefore, limited to vegetation structure (not species composition).

[3] Mid-scale mapping is a remote sensing and modeling effort used to provide periodic snapshots of existing vegetation for forest plan implementation and monitoring. Mid-scale mapping is an object-oriented approach using image segmentation and various classification methodologies to model vegetation dominance type, canopy cover class, and size.

historical) was subtracted from 100 for each class. The resulting number determined the level of departure from the historical reference conditions as follows:

- 0–33 percent = Low departure
- 34–66 percent = Moderately departed
- 67–100 percent = Severely departed

Ecosystem attributes for the Grasslands were analyzed to determine if the sustainability of the vegetation types, soil, water, air, and animal and plant species richness and diversity are at risk. This assessment was based on current conditions, departure from reference condition for vegetation structure, and projected future trends. If the ecosystem attribute is projected to depart from its reference condition, then the attribute was determined to be at risk. If the attribute is significantly departed from its reference condition and is stable (i.e., neither trending further away from nor toward the reference condition) then it was determined to be at risk; this scenario was not found for any of the ecosystem characteristics on the Grasslands. If current management activities are resulting in the ecosystem characteristic trending toward its reference condition, the characteristic was determined not to be at risk.

Four of the seven vegetation types found on the Grasslands have greater representation on the Grasslands relative to the surrounding landscape within the Grasslands administrative boundary: shinnery oak, mixed hardwood riparian, cottonwood-willow, and sand sagebrush. Shortgrass and mixed-grass prairie have less representation on the Grasslands relative to the surrounding landscape; pinyon-juniper is equally represented.

All of the vegetation types have low departure from reference condition for vegetation structure (figure 1). Continuation of management trends is expected to maintain that condition.

Some of the vegetation types, while within low departure from reference condition for vegetation structure overall, may not be able to make a full recovery to the lower percentages of departure. These include the shinnery oak areas that were once deeply plowed, as well as formerly cultivated old field sites in shortgrass prairie. The deep plowing practices on shinnery oak eliminated the species from some areas during the Dust Bowl era, and recovery does not readily occur. Soil movement that occurred during the Dust Bowl era also created conditions that facilitated mixed hardwood riparian establishment, a vegetation type not historically found on the Grasslands. Consequently, determining a departure from reference condition for mixed hardwood riparian on the BK and MC (BKMC) NGs entails comparing riparian woody vegetation structure to the mixed hardwood plant communities in other areas with similar climate, elevation, rainfall, and growing season attributes. Some areas within the cottonwood-willow riparian may not have the capacity to fully recover to the lower percentages of departure from reference condition for vegetation structure due to the disruption of natural hydrologic processes on and off of the Grasslands. While the reference condition for vegetation structure may not be fully achievable on some areas within the shinnery oak, shortgrass prairie, mixed-hardwood riparian, and cottonwood-willow riparian vegetation types, implementation of the draft Grasslands plan should move these types toward reference condition for vegetation structure.

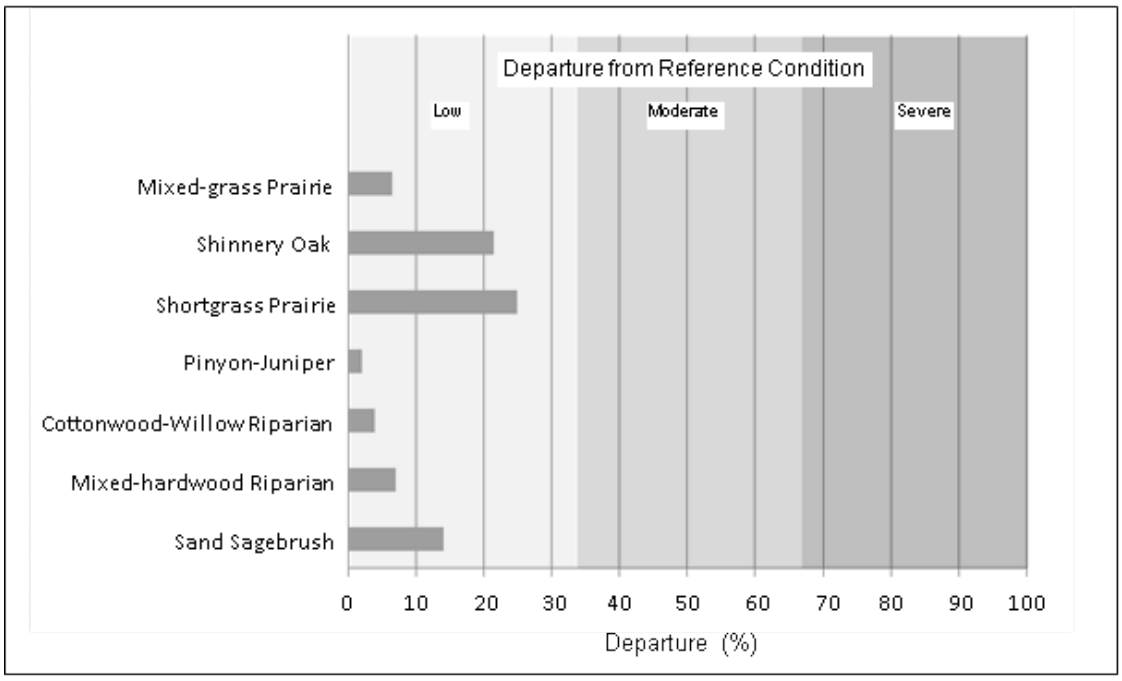


**Figure 1. Departure of current condition vegetation structure from reference condition vegetation structure.**

Over the past several decades, watershed conditions have dramatically improved, especially compared to the extremely degraded condition that occurred during the 1940s and 1950s following the Dust Bowl era. Conservation practices across the southern Great Plains, notably in the McClellan Creek drainage, have resulted in a substantial increase in infiltration and groundwater recharge and a subsequent reduction in surface runoff and associated sedimentation. Groundwater depletion is occurring, and although this is outside of Agency control, it has the potential to affect Grasslands management.

### Ecosystem Diversity Concern Areas

Due to disruption from settlement and agriculture production on adjacent private lands, the vegetative characteristics found on the Grasslands are largely unique in comparison to the surrounding landscape. Because the Grasslands exist to provide for ecological diversity, it is critical that the ecosystem characteristics contained within them be restored and maintained. There are several areas of ecosystem diversity concern:

- Four of the seven vegetation types (shinnery oak, pinyon-juniper, mixed hardwood riparian, and sand sagebrush) have a reduced range across their respective ecological subsections. Therefore, management of these vegetation types on the Grassland units is important for the protection of their associated species.
- Of the seven vegetation types found on the Grasslands, all exhibit low departure from reference condition for vegetation structure. Management to maintain or move toward lower departure from reference condition and disturbance regime intervals is important for each of the vegetation types.

- The introduction, presence, and spread of invasive species have the potential to significantly modify ecological systems and processes.
- The potential effects of climate change are far reaching: changes to vegetation structure and composition, soil condition, and water availability are reasonably foreseeable.

## 2. Identification of Species Viability Concerns

### Species Diversity

Analysis of ecological sustainability must include consideration of both ecosystem and species diversity. To better capture the ecological sustainability of the Grasslands, a hierarchical approach was used to analyze species diversity on the Grasslands (pp. 49–52 in ESR). A comprehensive list of species (including plant, macro-lichen, bird, insect, and animal species) that have population or habitat concerns and that are found in Texas, New Mexico, and Oklahoma was developed using:

- Lists maintained under the Ecological Services Agency of the U.S. Fish and Wildlife Service;
- Species ranks maintained by NatureServe;
- New Mexico, Texas, and Oklahoma State threatened and endangered lists;
- New Mexico, Texas, and Oklahoma priority Comprehensive Wildlife Conservation Strategy (CWCS) species;
- Species for which there are local concerns resulting from declines in habitat, population, and/or distribution;
- Species that are of high public interest; and
- Species that have emerging issues (such as invasive species).

Using this comprehensive list as a starting point, research was conducted to determine those species that currently have:

- population and/or habitat within the plan area;
- population and/or habitat concerns (e.g., small or decreasing population, degrading habitat or habitat loss, etc.); or
- may be affected by Forest Service management actions.

### Regional Forester's Grasslands Sensitive Species List

The regional forester's sensitive species program is the Forest Service's dedicated initiative to conserve and recover plant and animal species. The national grasslands improve habitat and restore ecosystems for sensitive species through vegetation treatments and management practices. Forest sensitive species (table 1), are those plant and animal species identified by a regional forester for which population viability is a concern as evidenced by:

- Significant current or predicted downward trends in population numbers or density
- Significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution

**Table 1. Regional Forester's Grasslands Sensitive Species List**

| Regional Forester's Grasslands Sensitive Species List for Kiowa, Rita Blanca, Black Kettle, and McClellan Creek National Grasslands | | | |
|---|---|---|---|
| **Common Name** | **Taxon** | **Forest Status** | |
| | | **BKMC NGs** | **KRB NGs** |
| **Amphibians** | | | |
| Plains leopard frog | *Rana blairi* | D | D |
| Great Plains narrow-mouthed toad | *Gastrophryne olivacea* | D | D |
| **Fish** | | | |
| Rio Grande chub | *Gila pandora* | | D |
| Suckermouth minnow | *Phenacobius mirabilis* | D- not rare in OK, TX | D |
| **Birds** | | | |
| Bald Eagle | *Haliaetus leucocephalus* | D | D |
| White-faced Ibis | *Plegadis chihi* | | D |
| Zone-tailed Hawk | *Buteo albonotatus* | | D |
| Swainson's Hawk | *Buteo swainsoni* | D | D |
| Ferruginous Hawk | *Buteo regalis* | | D |
| American Peregrine Falcon | *Falco peregrinus (anatum)* | | S |
| Lesser Prairie-chicken | *Tympanuchus pallidicinctus* | S | S |
| Mountain Plover | *Charadrius montanus* | | D |
| Burrowing Owl | *Athene curnicularia (hypugaea)* | D | D |
| Loggerhead Shrike | *Lanius ludovicianus* | D | D |
| Yellow-billed Cuckoo | *Coccyzus americanus occidentalis* | | S |
| **Mammals** | | | |
| Pale Townsend's big-eared bat | *Corynorhinus townsendii (pallescens)* | | S |
| Black-tailed prairie dog | *Cynomys ludovicianus* | | D |
| Sandhills white-tailed deer | *Odocoileus virginianus texana* | | D |
| **Reptiles** | | | |
| Arid land ribbon snake | *Thamnophis proximus diabolicus* | | D |
| **Plants** | | | |
| Greene milkweed | *Asclepias uncialis ssp. uncialis* | | D |
| One-flowered milkvetch | *Astragalus wittmannii* | | D |
| Spellingberg's groundsel | *Packera spellenbergii (=Senecio s.)* | | D |

D = Documented, reliable, recorded observation, in appropriate habitat within the Grassland boundary.

S = Suspected, likely to occur based on habitat availability to support individuals/breeding pairs/groups within the Grassland boundary.

## 3. Collection of Information on Species with Viability Concerns

### Species Viability Risk Assessments

The initial overall species database was developed from NatureServe, an international network of biological inventories, known as natural heritage programs or conservation data centers, operating in all 50 U.S. states, Canada, Latin America, and the Caribbean. NatureServe provided detailed local information on plants, animals, and ecosystems. The objective scientific information about species and ecosystems developed by NatureServe was used by the plan revision team to make informed decisions about species in the planning area (pp. 52–62 in the ESR).

Texas, Oklahoma, and New Mexico have comprehensive wildlife conservation strategies (CWCS) that were used to focus on the respective state wildlife, plant, and habitat concerns. The U.S. Fish and Wildlife Service National Birds of Conservation Concern (NBCC) species were included as well as state threatened and endangered species lists.

The comprehensive list was narrowed down to just those species that occur on the Grasslands and may be affected by Forest Service management. The species were sorted according to the vegetation type or unique habitat feature with which they are associated. Each of the vegetation types on the Grasslands, along with some unique habitat features (e.g., wetland or riverine), have adequate representation from species on the list of species for consideration in plan revision (appendix B in the ESR, see the Web address provided to the ESR in appendix B of this FPEIS).

Life history and population information was gleaned from the references used in the screening process and from Grasslands biologists; States of Oklahoma, Texas, and New Mexico biologists; and U.S. Fish and Wildlife Service biologists. Meetings were held with the before mentioned personnel to conduct the species viability determination by processing each species through an assessment of various habitat and population factors and threats. The viability determination process steps and results are detailed in the ESR (appendix E in the ESR).

Initially, 1,652 species with population or habitat concerns in Texas, Oklahoma, and New Mexico were considered for Grasslands plan revision. This list was then narrowed down to just those species that occur on the Grasslands and may be affected by Forest Service management. These species were sorted according to the vegetation type or unique habitat feature with which they are associated. Each of the vegetation types on the Grasslands, along with some unique habitat features (e.g., wetland or riverine), have adequate representation from species on the list of species for consideration in plan revision (appendix B in the ESR).

An animal and plant species viability assessment was conducted by processing each species potentially occurring on the Grasslands through an assessment of various habitat and population factors and threats[4]. Natural history and population information was gleaned from the references used in the screening process and from Grasslands biologists; States of Oklahoma, Texas, and New Mexico biologists; and U.S. Fish and Wildlife Service biologists. The results of this process provided a numerical ranking of the risk to a species.

[4] "Fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired nonnative vertebrate species in the planning area. For planning purposes, a viable population shall be regarded as one which has the estimated numbers and distribution of reproductive individuals to insure its continued existence is well distributed in the planning area…" (1982 Rule Provisions 219.19).

The risk assessment process included the following steps and the results for each species can be referenced (appendix E in ESR).

Habitat factors within the plan area boundaries (per FSH 1909.12, Land Management Planning Handbook, Chap. 40, Sec. 43.26) were assessed for each species, according to PNVT. For those species with habitat on multiple vegetation types, separate risk assessments were run for each habitat type. Each of the habitat factors were assessed in terms of the historic, current, and projected future trends. As a way of synthesizing the overall habitat status for the species on a specific vegetation type, the average "score" for the current condition and projected trend was calculated and a status statement for the species habitat developed. The habitat factors considered in the assessment included:

- Amount: The percentage of the plan area that is specific to a particular vegetation type habitat.
    - High quantity of habitat encompasses >50 percent of the total plan area.
    - Moderate quantity indicates habitat is restricted to between <50 percent and >5 percent of the total plan area.
    - Low quantity indicates that habitat is limited to <5 percent of the total plan area.
- Quality: The availability of key habitat features in the plan area boundary.
    - A high quality habitat has adequate representation of all vegetation type successional stages and includes plenty of key habitat feature availability (i.e. nesting sites, roost trees, brood habitat, etc.).
    - A moderate quality rating indicates that key habitat features are present, but are not all readily available.
    - A low quality rating indicates that key habitat features are not always present and not all available.
- Distribution: The distribution of habitat features across a vegetation type within the plan area boundary.
    - Even habitat distribution indicates that habitat is dispersed broadly across the vegetation type.
    - Restricted habitat distribution describes vegetation types where habitat is localized to specific areas.
    - Highly fragmented habitat describes vegetation types where habitat is isolated and separated by distance or barriers.
- Habitat processes: Those processes (e.g., grazing, fire, flooding, etc.) that create or sustain the habitat within the plan area boundary.
    - Functioning habitat indicates that the processes are extant within the vegetation type.
    - Disrupted habitat indicates that not all processes are extant within the vegetation type.

Population factors were considered at the scale at which biological populations of the species operate (per FSH 1909.12, Land Management Planning Handbook, Chap. 40, Sec. 43.26). Each of the population factors were assessed in terms of the historic, current, and projected future trends. As a way of synthesizing the overall population status for the species on a specific PNVT, the average "score" for the current condition and projected trend was calculated and a status statement for the population factors developed. The population factors included in the assessment included:

- Population distribution: Interaction within the population.
    - High isolation describes a population that is separated by barriers and or distance.
    - Moderate isolation indicates that the population is separated, but has interaction on a limited basis.
    - High interaction describes a population that interacts regularly across its range.
- Population size: Size of population, relative to individual species dynamics.
    - A large population indicates that the species has great numbers relative to the individual species dynamic.
    - A moderate population indicates that the species population number is not large or is limited.
    - A small population describes a species whose population number is very limited.
- Species population stability: Current changes to the species population.
    - Gaining describes species whose populations are growing.
    - Stable describes species whose population sizes are not changing.
    - Declining describes species whose populations are decreasing.
- Species diversity: Phenotypic, ecological, and genetic diversity.
    - High diversity describes species with vigorous population diversity dynamics.
    - Moderate diversity describes species with stable diversity dynamics.
    - Low diversity describes species with decreasing diversity opportunities.

"Other threats" including risks to the vegetation type and other known threats such as invasive species, disease, etc., to the species were identified and the severity (how bad the negative outcome may be) and the likelihood (the probability of a negative outcome) of the threats were analyzed.

- Severity: How a species population or habitat would respond to a threat and was evaluated to determine the degree the species would be impacted.
    - High severity indicates that the threat will affect the species population in a critical negative manner.
    - Moderate severity indicates the threat impacts would be severely negative.

  - Low severity indicates that the threat impacts are chronic.

- Likelihood: The probability of a negative outcome from a threat to the species population or habitat.
  - High likelihood indicates that the threat will have an imminent negative outcome.
  - Moderate likelihood indicates that odds are even that the threat will produce a negative outcome.
  - Low likelihood indicates that the probability of negative outcomes due to the threat is possible but not imminent.

Descriptions of key biological interactions were developed, where they exist, for each species.

To determine the overall risk to each species, an overall score was calculated by averaging the habitat, population, risk, severity, and likelihood scores. Each species was then determined to be at high (average score of 1 to 1.5), moderate (average score of 1.51 to 2), or low (average score over 2.1) risk.

Status summary statements were developed to describe the overall current and projected status for the species on a particular vegetation type.

Risk summary statements were developed to capture the potential severity and likelihood of the known threats on the species' population and habitat.

Lastly, for those species determined to be at high risk, the likelihood of the species population dynamics being affected by four key consequence scenarios[5] was determined.

## 4. Identification of Species Groups or Habitat Association

### Species and Habitat Association

The species that were considered for plan revision were organized and grouped according to their associated vegetation types and the Grasslands on which they occur (table 2).

[5] The four consequence scenarios considered (per the Forest Service's Southwestern Region's "Ecological Sustainability" guidance, Version 5.1, 10/10/2006, Status of Species, table 7) included: (1) widespread decline of population in the plan area and new isolation of populations within the plan area; (2) widespread population decline, but without isolation of populations; (3) localized population decline that may be accompanied by some minor restrictions in population interactions, and (4) populations and their distribution are stable or improving.

**Table 2. Grasslands habitat/species associations and viability/risk ranking, Forest sensitive species, or management indicator species**

| Common Name | Ranger District | Viability Overall Risk | Reason for Listing (see note below) | | |
|---|---|---|---|---|---|
| | | | Viability Listing Source | Forest Sensitive List | MIS |
| **Shortgrass Prairie** | | | | | |
| Bald Eagle | KRB | Moderate | A, D, E, F | K | |
| Loggerhead Shrike | KRB | Low | A, C | K | |
| Black-tailed prairie dog | KRB | High | I-NM | K | |
| Burrowing Owl | KRB | Moderate | B, C, D | K | M |
| Ferruginous Hawk | KRB | Moderate | B, C, D | K | |
| Greene milkweed | KRB | Moderate | H, I-NM & OK | K | |
| Mountain Plover | KRB | High | A, B, C, J | K | |
| One-flowered milkvetch | KRB | Moderate | H, I-NM | K | |
| Spellenberg's groundsel | KRB | Moderate | H, I-NM | K | |
| Long-billed Curlew | KRB | Low | B, C, D | K | |
| Swift fox | KRB | High | G | | |
| Dotted checkerspot | KRB | Moderate | I-NM | | |
| Alpine fever-few | KRB | Moderate | H, I-NM | | |
| Rhena-crossline skipper | KRB | Moderate | I-NM | | |
| Andean Prairie-clover | KRB | Moderate | I-TX & OK | | |
| Scaled Quail | KRB | Low | A, C | | |
| Swainson's Hawk | KRB | Low | B, C | K | |
| Grasshopper Sparrow | KRB | Low | A, B | K | |
| **Sand Sagebrush** | | | | | |
| Lesser Prairie-chicken | KRB | High | B, J | K | |
| Dotted checkerspot | KRB | Moderate | I-NM | | |
| Scaled Quail | KRB | Low | A, C | | |
| Grasshopper Sparrow | KRB | Low | A, B | K | |
| Panhandle spurge | KRB | Moderate | H | | |
| **Pinyon-Juniper** | | | | | |
| Greene milkweed | KRB | Low | H, I-NM & OK | K | |
| Panhandle spurge | KRB | Moderate | H | | |

| Common Name | Ranger District | Viability Overall Risk | Reason for Listing (see note below) | | |
|---|---|---|---|---|---|
| | | | Viability Listing Source | Forest Sensitive List | MIS |
| One-flowered milkvetch | KRB | Moderate | H, I-NM | K | |
| Spellenberg's groundsel | KRB | Moderate | H, I-NM | K | |
| Zone-tailed Hawk | KRB | Moderate | | K | |
| Mountain Bluebird | KRB | Low | | | M |
| **Cottonwood-Willow Riparian** | | | | | |
| Bald Eagle | KRB | Moderate | A, D, E, F | K | |
| Great Plains narrow-mouthed toad | KRB | Moderate | D | K | |
| Plains leopard frog | KRB | High | B | K | |
| Yellow-billed Cuckoo | KRB | Low | A | K | |
| Sandhill white-tailed deer | KRB | Low | | K | |
| Arid land ribbon snake | KRB | Moderate | A, D | K | |
| Hobomok skipper | KRB | Moderate | I-NM | | |
| Red-headed Woodpecker | KRB | Low | A, B, C | | |
| **Ponds and Playas** | | | | | |
| White-faced Ibis | KRB | Low | A, B | K | |
| Plains leopard frog | KRB | High | B | K | |
| Long-billed Curlew | KRB | Moderate | B, C, D | K | |
| American Avocet | KRB | Moderate | B | | |
| **Caves-Cliffs-Rock Outcrops** | | | | | |
| American Peregrine Falcon | K | Low | D | K | |
| Pale Townsend's big-eared bat | K | Low | B | K | |
| Rocky Mountain dagger | KRB | Moderate | H | | |
| Horrid herrickia | KRB | Low | H, I-NM | | |
| **Shinnery Oak and Mixed-grass Prairie** | | | | | |
| Swainson's Hawk | BK | Low | B, C | K | |
| Lesser Prairie-chicken | BK | High | B, J | K | |
| Northern Bobwhite | BK | Moderate | B, C | | |
| Rio Grande Turkey | BK | Low | L | | M |
| Grasshopper Sparrow | BK | Low | A, B | K | |

| Common Name | Ranger District | Viability Overall Risk | Reason for Listing (see note below) | | |
|---|---|---|---|---|---|
| | | | Viability Listing Source | Forest Sensitive List | MIS |
| Long-billed Curlew | BK | Low | B, C, D | K | |
| **Mixed Hardwood Riparian** | | | | | |
| Yellow-billed Cuckoo | BK | Low | A | K | |
| Rio Grande Turkey | BK | Low | L | | M |
| Red-headed Woodpecker | BK | Moderate | A, B, C | | |
| Bell's Vireo | BK | Moderate | B, E | K | |
| **Rivers** | | | | | |
| Suckermouth minnow | KRB | Moderate | E | K | |
| Conchas crayfish | KRB | Moderate | H | | |
| Rio Grande chub | KRB | Low | H,I-TX | K | |
| Arkansas River shiner | BK | Moderate | Federal T&E | | |
| Interior Least Tern | BK | Moderate | Federal T&E | | |
| Largemouth bass | BK | Low | L | | |
| **Aquatic Lakes** | | | | | |
| White-faced Ibis | KRB | Low | A, B | K | |
| Bald Eagle | BK | Moderate | A, D, E, F | K | |
| Largemouth bass | BK | Low | L | | |
| Plains leopard frog | BK | Low | B | K | |
| **Other Wetlands** | | | | | |
| Ambersnail | KRB | Moderate | H | | |

Alphabetic code for "Reason for Listing" is as follows: A = NM CWCS, B = TX CWCS, C = OK CWCS, D = NM T&E, E = TX T&E, F = OK T&E, G = Nature Serve N, H = Nature Serve G, I = Nature Serve State, J = USFWS Candidate, K = Regional Forester's Grasslands Sensitive Species, L = Important Game Species, M = Management Indicator Species

## 5. Description of Conservation Approaches

Plan components (desired conditions, objectives, and guidelines) guide the LRMP:

> **Desired conditions** define ecological outcomes to be achieved in the future. These outcomes relate to land and resource conditions and ecological processes. They are aspirations and strategic in nature rather than project-specific commitments. Some desired conditions may be achieved within the 15-year life of the plan, and others may extend beyond that timeframe. Desired conditions form the principal basis from which LRMP objectives are developed. Desired conditions ultimately serve to guide Grassland managers in planning and providing

direction for future actions and in developing a meaningful monitoring program to determine progress toward achievement over the life of the plan.

**Objectives** are the proactive steps that the Grasslands expect to accomplish over the next 15 years to maintain or move toward the desired conditions of the plan. Objectives are measurable and time-specific outcomes. Any project or activity undertaken during the life of the plan must be consistent with objectives.

**Guidelines** contribute to maintaining or achieving desired conditions and objectives; they are specifications that a project or activity would adopt unless there is a compelling and defensible reason to vary from the guidelines.

All the vegetation types found on the Grasslands are in low departure from reference condition for vegetation structure and occur on a diverse landscape where species composition and structure are determined by climate, elevation, landform, slope, and soil properties. The desired conditions would support a full complement of native species:

- There is a natural and nearly complete assemblage of native plants and animals, including important game species, distributed across the Grasslands.
- Natural corridors link habitats within Grassland units.
- Terrestrial ecosystems are resilient to disturbance and tolerate the effects of and, therefore, benefit from, wildland fire in a near natural fire regime.
- Natural processes occur within the vegetative communities that enhance species richness and diversity.
- Forage use by grazing ungulates contributes to a diversity of healthy herbaceous and woody plant communities and supports continued viability of wildlife populations.
- Objectives and guidelines produce outcomes that support sustainable plant communities and habitat for species with viability concerns.
- Land management practices fulfill habitat requirements for all life history stages of viability high at-risk species.

### 6. Development of LRMP Alternatives

The issues that led the Agency to develop alternatives to the no action alternative A, which is the 1985 Cibola National Forest (NF) LRMP as amended, included:

- The age of the current plan, the lack of detail relevant to management of the Grasslands, and silence on emerging issues affecting the Grasslands;
- The often evident ambiguity of the stated management direction of the current plan with the actual, science-based, adaptive management currently occurring on the Grasslands;
- The desire by some members of the public to have the regional forester propose to Congress the designation of the Canadian River Inventoried Roadless Area on the Kiowa National Grassland as a wilderness area, a suggestion opposed by others.

The species identified for viability concerns in plan revision—Lesser Prairie-chicken, plains leopard frog, BTPD, Mountain Plover, and swift fox—were assessed to be at high risk on shinnery oak, mixed-grass prairie, sand sagebrush, cottonwood/willow riparian, and shortgrass

prairie vegetation types. The risks to these species were found to be the threats derived from fragmentation, disease, predation, and invasive species.

The Forest Service developed three alternatives—the no action alternative (A), the preferred alternative (B), and the wilderness alternative (C). Alternative A is current management under the 1985 Cibola NF LRMP as amended. Alternative B is the "rolling" alternative resulting from continuous adjustment during its development. Alternative C is identical to alternative B except for the Canadian River Wilderness recommendation.

Public comments received in response to the proposed action provided suggestions for alternative methods for satisfying the purpose and need. Some of these alternatives may have been outside the scope of identified needs, duplicative of the alternatives considered in detail, or determined to be components that would cause unnecessary environmental harm. Therefore, a number of alternatives were considered, but dismissed from detailed consideration.

#### Alternative B, Preferred Alternative

Alternative B would: emphasize management of vegetation and habitat to move toward desired vegetation structure and species composition; incorporate research and potential strategies for addressing effects of climate change; address invasive species control on all Grasslands; provide direction for removal of invasive or nonnative trees from historically grassland vegetation communities or in otherwise suitable Lesser Prairie-chicken (LPC) habitat on the BK NG, following site-specific assessment; recommend adaptive management of livestock and protection of soil resources; and would update manual, handbook, law, regulation, and policy and remove redundancy in all management direction.

Alternative B would describe a management approach that would encourage black-tailed prairie dog (BTPD) colonies to expand on the Kiowa (K) and Rita Blanca (RB) NGs that would possibly result in an increase in early successional plant communities in those areas of shortgrass prairie with soils and slopes typically selected by BTPD. A BTPD management plan would be recommended. A long-term desired condition would have sufficient habitat available for at least one BTPD complex to accommodate potential reintroduction of black-footed ferrets (BFF) a federally listed endangered species.

#### Alternative C, Canadian River Wilderness Area Recommendation

Recommendation would be made to designate the Kiowa National Grassland Canadian River Inventoried Roadless Area (IRA) as a Canadian River wilderness area. Specific plan components for a wilderness area designation would be developed. Management within the potential wilderness area would be governed by Wilderness Act regulations as described in Forest Service Manual 2320. All other management direction in alternative C would be identical to that of alternative B.

### 7. Evaluation of Effects on Viability of the LRMP Alternatives

Currently, all the vegetation types found on the Grasslands are in low departure from reference condition for vegetation structure. Plan components—including desired conditions, objectives, and guidelines—were developed for managing vegetation types and habitat to support the

requisite needs of the species with viability concerns and the Forest sensitive species found on the Grasslands.

A suite of management indicator species (MIS) and ecological indicators (EI) were selected to evaluate the consequences to MIS and EI from the three alternatives. Monitoring Burrowing Owl, Mountain Bluebird, and Rio Grande Turkey populations as management indicator species allows trend information to be used to evaluate management direction. Monitoring the presence of undesirable woody species in cottonwood-willow riparian, shinnery oak, and mixed-grass prairie vegetation, and reference condition on mid- and late-structural stages of shortgrass prairie allows trends information to be used as ecological indicators.

Considering that the vegetation on the Grasslands is in low departure from reference condition for vegetation structure, and the plan components were developed to move toward desired vegetation structure and species composition, alternatives A and B would have similar impacts on the chosen MIS and EI. Alternative B would have more prescriptive management of vegetation and habitat that would increase the sustainability of habitat for species with viability concerns over alternative A. Alternative C would have the same positive consequences to viability as alternative B except in wilderness where reference condition management of vegetation could require added time.

#### Management Indicator Species (MIS)

*Burrowing Owl/Shortgrass Prairie Early Successional Stage.* Common to all alternatives, early succession stage development would result from black-tailed prairie dog colony expansion. All of the alternatives would attain expansion of dog colonies that would provide habitat for Burrowing Owl.

*Rio Grande Turkey/Mixed Hardwood Riparian Vegetation.* Alternatives B and C would improve habitat for the MIS by attaining seral stage diversity, whereas alternative A does not provide predictable trends.

*Mountain Bluebird/Pinyon-Juniper.* Alternatives B and C would improve habitat for the MIS by attaining seral stage diversity, whereas alternative A does not provide predictable trends.

#### Ecological Indicators (EIs)

*Areal Extent of Undesirable Trees/Mixed-grass Prairie and Shinnery Oak.* Alternatives B and C would target removal of undesirable native invasive trees such as eastern redcedar and black locust and undesirable nonnative invasive Siberian elm. Although alternative A would allow removal of invasive plants, there would be no focus on removing undesirable trees in these vegetation types.

*Areal Extent of Undesirable Trees (especially saltcedar)/Cottonwood-Willow Riparian on the Canadian River.* Alternatives A and B would have similar, positive impacts by removal of noxious/invasive plant species which would improve wildlife habitat. In the potential wilderness, alternative C (with limited control options) would be less effective than alternatives A and B.

*Spatial analysis of the areal extent of plant communities by range vegetation trends/Mid-Late Successional Stages of Shortgrass Prairie and all stages of Sand Sagebrush.* All the alternatives

would monitor areal extent of plant communities; however, only alternatives B and C determine if plan component desired conditions for the two vegetation types are being met for wildlife habitat.

#### Viability High At-Risk Species

*Black-tailed Prairie Dog, Mountain Plover, and Swift Fox/Shortgrass Prairie. Common to All Alternatives*, early successional stage development would result from black-tailed prairie dog colony expansion providing habitat improvements for the three high at-risk species on shortgrass prairie.

*Lesser Prairie-chicken/Shinnery Oak, Mixed-grass Prairie, and Sand Sagebrush.* Alternatives B and C would target removal of undesirable native invasive trees such as eastern redcedar and black locust and undesirable nonnative invasive Siberian elm. Reference condition attainment in the three vegetation types would improve ground nesting bird cover and brood rearing habitat, provide travel corridors and escape routes within the shrub cover, and small areas of short herbaceous vegetation or patches of bare ground would be available for Lesser Prairie-chicken leks and courtship areas. Alternative A does not provide predictable trends for any of the three vegetation types.

*Plains Leopard Frog/Cottonwood-Willow Riparian*. Alternatives B and C would attain a diverse mix of native grasses and forbs adapted to moisture-regime fluctuations in the herbaceous portion of riparian areas. Meander scars and depressions in the riparian areas would retain water for part or all of the year and provide habitat for the plains leopard frog. Alternative A would provide an unpredictable state of vegetative structure and composition and associated habitats.

#### Regional Forester's Grasslands Sensitive Species

Considering that all vegetation types on the Grasslands are in low departure from reference condition for vegetation structure, and that plan components were developed to move toward desired vegetation structure and species composition, alternatives B and C would attain similar positive consequences for all of the Grasslands sensitive species. Alternative A would provide an unpredictable state of vegetative structure and composition and associated habitats for the Forest sensitive species.

### 8. Monitoring

The primary purpose of monitoring species at risk and their habitats is to determine whether management actions need to be modified. The establishment of monitoring objectives for species at risk must take into account the state of current knowledge about the species, its rarity, ease of detection, level of risk, the strength of association between habitat conditions and population dynamics, and the expected lag time between disturbances and biological responses.

The following are monitoring objectives related to whether management actions need to be modified to meet species viability needs:

- Determine whether the status of selected species is in keeping with plan direction (for very rare or poorly distributed species, species without habitat associations, or for federally listed species for which population monitoring is specified in the recovery plan, or for which population monitoring is considered important).

- Determine whether ecological conditions for selected species are consistent with plan direction (for species whose population dynamics are believed to be responsive to changes in ecological conditions).
- Determine whether there are unexpected changes in habitats or populations for species that were not identified to be of concern during the planning process (to address whether all species that ought to have been considered in the planning process were identified).
- Investigate assumptions made about effects of management on ecological conditions for species for which there is a viability concern (for species with clear habitat associations, but uncertainty regarding the effects of management).
- Investigate assumptions about the effects of management on species populations (for species where the link between management action and species status is uncertain).

It may not be necessary to monitor a host of habitat attributes or population parameters. Much can be gained by monitoring one or two carefully chosen indicators that are fairly easy to measure or observe, particularly if these indicators are responsive to changes in stressors that are monitored over the same period of time.

The monitoring protocol is a plan component that includes a discussion of data collection, data analysis, data storage, and reporting methods. This protocol covers frequency of measurement, expected precision and reliability of the system, and an indication of when the evaluation will be reported (1982 Rule Provision Section 219.12(k)). Tables 3 and 4 summarize the monitoring frequency and measures.

**Table 3. Black Kettle and McClellan Creek monitoring frequency and measures**

| Black Kettle and McClellan Creek Management Area Vegetation Types Represented by Ecological Indicators | |
|---|---|
| **Mixed-grass Prairie Ecological Indicator (areal extent of undesirable trees)**<br>The mixed-grass prairie vegetation type is in low departure from reference condition for vegetation structure. Monitoring the existence and encroachment of undesirable woody species, such as eastern redcedar and black locust, will indicate the success of management. The presence of undesirable woody vegetation will serve as the ecological indicator. | |
| **Scale** | **Monitoring Frequency and Measure** |
| Black Kettle and McClellan Creek | Annual<br>Document undesirable tree treatment and postfire mortality.<br>Change in species composition within burned areas.<br>Document planned or unplanned fire occurrences. |

| **Shinnery Oak and Deep Plowed Inclusion Ecological Indicator (areal extent of undesirable trees)**<br>The shinnery oak vegetation type is in low departure from reference condition for vegetation structure. Monitoring the existence and encroachment of undesirable woody species, such as eastern redcedar and black locust, will indicate the success of management. The presence of undesirable woody vegetation will serve as the ecological indicator. | |
|---|---|
| **Scale** | **Monitoring Frequency and Measure** |
| Black Kettle | Annual<br>Document undesirable tree treatment and postfire mortality.<br>Change in species composition within burned areas.<br>Document planned or unplanned fire occurrences. |
| **Black Kettle and McClellan Creek Management Area Vegetation Types Represented by Management Indicator Species** | |
| **Mixed Hardwood Riparian**<br>*Meleagris gallopavo intermedia*, Rio Grande Turkey, represents a species that utilizes all successional stages of mixed hardwood riparian and will serve as the management indicator species for this vegetation type. | |
| **Scale** | **Monitoring Frequency and Measure** |
| Black Kettle | Annual<br>Use breeding bird survey to monitor Meleagris gallopavo intermedia; Rio Grande Turkey as a management indicator dpecies. |

**Table 4. Kiowa and Rita Blanca monitoring frequency and measures**

| **Kiowa and Rita Blanca Management Area Vegetation Types Represented by Ecological Indicators** | |
|---|---|
| **Shortgrass Prairie Mid- and Late-Successional Stages** | |
| **Scale** | **Monitoring Frequency and Measure** |
| Kiowa and Rita Blanca | Every 5 years<br>The ecological indicator of mid- and late-successional shortgrass prairie will be determined by spatial analysis of the areal extent of plant communities. Mid- and late-successional shortgrass prairie will be monitored for range vegetation trends based on the area within the proclaimed boundary of the Kiowa and Rita Blanca National Grasslands.<br>Document planned or unplanned fire occurrences.<br>Document vegetation composition and structure for different successional stages, including mesic or xeric areas. |
| **Sand Sagebrush** | |
| **Scale** | **Monitoring Frequency and Measure** |
| Kiowa and Rita Blanca | Every 5 years<br>The ecological indicator of sand sagebrush will be determined by spatial analysis of the areal extent of plant communities. Sand sagebrush will be monitored for range vegetation trends based on the area within the proclaimed boundary of the Kiowa and Rita Blanca National Grasslands.<br>Document planned or unplanned fire occurrences. |

| **Cottonwood-Willow Ecological Indicator (Presence of Undesirable trees)**<br>The presence of undesirable woody species, such as saltcedar, will serve as the ecological indicator for the cottonwood-willow riparian vegetation type in the Canadian River of the Mills Canyon Management Area. Reduction in saltcedar indicates trend or movement toward desired condition and management success. | |
|---|---|
| **Scale** | **Monitoring Frequency and Measure** |
| Kiowa and Rita Blanca | Monitor 3 to 5 years.<br>Document undesirable tree treatment. |
| **Kiowa and Rita Blanca Management Area Vegetation Types Represented by Management Indicator Species** | |
| **Pinyon-Juniper and Juniper Grasslands**<br>*Sialia currucoides*, Mountain Bluebird represents a species that utilizes all successional stages of pinyon-juniper and will serve as the management indicator species for pinyon-juniper. | |
| **Scale** | **Monitoring Frequency and Measure** |
| Kiowa | Annual<br>Mountain Bluebird represents a species that utilizes all successional stages of pinyon-juniper. Breeding bird survey to monitor *Sialia currucoides*; Mountain Bluebird to serve as a management indicator species. |
| **Shortgrass Prairie Early Successional Stages on the KRB NGs** | |
| **Scale** | **Monitoring Frequency and Measure** |
| Kiowa and Rita Blanca | Annual<br>Early successional shortgrass prairie on the KRB NGs associated with black-tailed prairie dogs will be monitored through the use of breeding bird surveys to track Athene cunicularia hypugaea or Burrowing Owl as a management indicator species. |

## Summary Narrative

Monitoring Burrowing Owl, Mountain Bluebird, and Rio Grande Turkey populations as management indicator species allows trend information to be used to evaluate management direction on early successional stages of shortgrass prairie, all seral stages of pinyon-juniper, and all seral stages in mixed hardwood riparian respectively. Monitoring the presence of undesirable woody species in cottonwood-willow riparian, shinnery oak, and mixed-grass prairie vegetation, and spatial analysis of the areal extent of plant communities on mid- and late-structural stages of shortgrass prairie and sand sagebrush allows trends information to be used as ecological indicators to evaluate management direction.

## Procedures for Implementing Species Viability Provisions and Documenting Viability

Species viability provision in the Grasslands plan revision is demonstrated through the processes described in the following sections of the LRMP:

- Analysis of the management situation (AMS) provides an explanation of how species considered for analysis in the planning process were determined, provides the ecological context for viability analysis, and disclosed basic habitat relationships, species status,

threats to viability, relationship of species to ecosystem processes, and methods used to group species.

- Objectives to maintain species viability were incorporated into the broader goals of ecosystem diversity and ecological sustainability, and were based on identified conservation approaches and other species information.
- Forest-wide guidelines were developed to provide specific language for ecological conditions for species analyzed in the planning process.
- Plan alternatives were developed to address maintaining species viability.
- Other management direction was provided for species viability where plan components could be complemented.
- The draft EIS "Affected Environment" section included the full list of species considered and highlighted some of the same features as the analysis of the management situation, discussed above.
- The draft EIS "Environmental Consequences" and "Cumulative Consequences" sections contains the evaluations of species viability. Consequences specific to the Grasslands and cumulative effects were both disclosed.
- The monitoring plan displays how species viability will be monitored and feedback processes that will be used to improve management based on monitoring results.

# Appendix G. Management Indicator Species and Ecological Indicator Species

## Process Criteria for Selection of Management Indicator Species and Ecological Indicator Species

### Kiowa, Rita Blanca, Black Kettle, and McClellan Creek National Grasslands

November 15, 2010

Approved by:

FOREST SUPERVISOR

### Management Indicator Species and Ecological Indicators

The National Forest Management Act (NFMA) regulations require that "Fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired nonnative vertebrate and invertebrate species in the planning area."

The 1982 Planning Rule provisions to implement the NFMA requires that management indicator species (MIS) be identified as part of the forest plan. MIS serve multiple functions in forest planning: focusing management direction developed in the alternatives, providing a means to analyze effects on biological diversity, and serving as a reliable feedback mechanism during forest plan implementation. The latter is accomplished by monitoring population trends in relationship to habitat changes (1982 Rule Provision Section 219.19(a)(6)).

Management indicator species is a concept adopted by the Agency to serve, in part, as a barometer for species viability at the forest level. The role of MIS in meeting viability mandates compliments that of several other approaches, particularly management of sensitive species. Ecological indicators (EI) are defined in FSM 2620.5-2 as "Plant or animal species, communities or special habitats that have a narrow range of ecological tolerance." The Agency does not consider EI as MIS. However, individual species of plants and animals could serve both as EI and MIS.

Each forest plan alternative must establish objectives that maintain and improve habitat for MIS, to the degree consistent with overall multiple-use objectives of the alternative (1982 Rule Provision Section 219.19(a)). To meet this goal, planning for the fish and wildlife resources must meet several requirements, including the following:

- To estimate the effects of planning alternatives on fish and wildlife populations, certain vertebrate and/or invertebrate species shall be selected as MIS. These species are to be selected because their population changes are believed to indicate the effects of management (1982 Rule Provision 219.19(a)(1)).

- Planning alternatives must be evaluated in terms of both amount and quality of habitat and of animal population trends of MIS (1982 Rule Provision 219.19(a)(2))
- Population trends of the MIS will be monitored and relationships to habitat changes determined (1982 Rule Provision 219.19(a)(6))

NFMA regulations suggest that several categories be considered when selecting MIS. The categories listed under 1982 Rule Provision 219.19(a)(1) are:

- Endangered and threatened plant and animal species identified on state and Federal lists
- Species commonly hunted, fished, or trapped
- Nongame species of special interest
- Species with special habitat needs that may be influenced significantly by planned management programs

Additional plant or animal species selected because their population changes are believed to indicate the effects of management activities on other species of selected major biological communities or on water quality.

Both the complete species list and the list of selected indicator species will be part of the documented analysis of the management situation.

The initial species list was generated from work completed in the development of the "Ecological Sustainability Report" (ESR) (see the Web address provided in appendix B of this FPEIS) during earlier stages of Grasslands plan revision. Species were selected and screened from the following sources:

- Threatened and endangered species lists maintained under the Ecological Services Agency of the U.S. Fish and Wildlife Service for the planning area;
- Species ranks maintained by NatureServe;
- New Mexico, Texas, and Oklahoma State threatened and endangered lists;
- New Mexico, Texas, and Oklahoma priority comprehensive wildlife conservation strategy (CWCS) species;
- Species for which there are local concerns resulting from declines in habitat, population, and/or distribution;
- Species that are of high public interest;
- Species that have emerging issues (such as invasive species); and
- Forest sensitive species list.

Using this comprehensive list as a starting point, research was conducted to determine those species that currently have:

- population and/or habitat within the plan area
- or may be affected by Forest Service management actions

The list was modified through review, correspondence, and/or personal contact with teams developed for each respective state, with the following specialists:

Oklahoma Department of Wildlife Conservation

- Melynda Hickman
- Scott Parry

U.S. Fish and Wildlife Service

- Ken Collins, Oklahoma
- Heather Whitlaw, Texas/New Mexico

Texas Parks and Wildlife Department

- Bill Johnson
- Sean Kyle

New Mexico Department of Game and Fish

- Mark L. Watson
- Leland J. S. Pierce
- James N. Stuart
- Hira A. Walker, PhD

Black Kettle and McClellan Creek National Grassland, Cheyenne, Oklahoma

- Bryan Hajny

Kiowa and Rita Blanca National Grassland, Clayton, New Mexico

- Rick Hanson
- Angela Safranek

Cibola National Forest (NF) Supervisor's Office, Albuquerque, NM

- Beverly deGruyter
- Don Jorgensen

Teams were determined by district location and the state where they reside. The respective teams reduced the list to species most commonly found in each vegetative type from which the choice of MIS could be made. The lists included only those species which are most identifiable to the specific vegetative type and which can most usually be found in the vegetative type regardless of its geographic location on the Grasslands. Resident species were preferred over migratory species. Indigenous species were preferred over introduced species.

The teams identified the constant biologic relationships between the species and characteristics of the habitat features within the vegetative type. These relationships were identified by one or more

factors including nesting requirements, breeding habitat, food, and cover requirements or other biologic relationships.

From the resulting list, the teams considered the selection of which species best represented the desired condition for the vegetative type that best meets all the above criteria.

If no species met the criteria for a vegetative type, no MIS was selected.

All vegetation types were also considered for ecological indictors where frequency, composition, and structure monitoring could be used.

A procedure for monitoring changes in vegetative types was established based on a relationship between the MIS and habitat features of each respective vegetative type or the EI. In design and implementation of the monitoring system, it was not intended that every acre of each vegetative type be improved or maintained to satisfy the requirements of the MIS or EI. Rather, it will be designed to monitor changes in the vegetative types in relation to overall requirements of the EI or MIS. Results of monitoring will be used as a guide to overall habitat conditions for other associated species in each vegetative type.

### MIS/EI Selection Discussion

The ESR evaluated the ecological systems of the Kiowa, Rita Blanca, Black Kettle and McClellan Creek National Grasslands (herein collectively referred to as the "Grasslands") and the relationship to the surrounding area (ESR). The ESR provided the information needed to determine topics or issues needing revision from the existing land and resource management plan for the Cibola NF. It outlined and put into context the relationship between the resources managed by the Grasslands and the broader ecological environment. The ESR has two main sections, "Ecosystem Diversity" and "Species Diversity." The "Ecosystem Diversity" section discusses conditions and trends in the vegetation communities and physical resources based on the reference condition vegetation structure of the vegetation types. Appendix F of the ESR supplements the information found in the "Ecosystem Diversity" section of the ESR. Specifically, it outlines the current and historical conditions for shortgrass prairie, pinyon-juniper, cottonwood-willow riparian, sand sagebrush, mixed-grass prairie, shinnery oak, and mixed hardwood riparian vegetation types.

The condition and trends in the Grasslands vegetation communities are evaluated on a 5- to 10-year interval using field reconnaissance, visual obstruction readings, Parker 3 Step transects, cover-frequency transects, production clippings, photo points, and composition inventories. Data collected has been compared with historical data and with the terrestrial ecological unit inventory.[1]

In order to determine the departure for a vegetation type, the mid-scale[2] vegetation found within each vegetation type was placed into one of three condition classes based on the information in

[1] Terrestrial ecosystem unit inventory consists of mapping and interpreting ecosystems through a systematic examination, description, classification and integration of the soil, vegetation, and climate on national forest and grasslands.

[2] Mid-scale mapping is a remote sensing and modeling effort used to provide periodic snapshots of existing vegetation for forest plan implementation and monitoring. Mid-scale is an object-oriented approach using image segmentation and various classification methodologies to model vegetation dominance type, canopy cover class, and size.

the reference condition model. A comparison was made of the current percentage to the historical percentage for each class within the model. The lesser of the two percentages (current vs. historical) was subtracted from 100 for each class. The resulting number determined the level of departure from historical conditions as follows: 0–33 percent = Low departure; 34–66 percent = Moderately departed; and 67–100 percent = Severely departed.

Figure 1 shows the departure from reference condition for vegetation structure for each vegetation type found on the Grasslands.

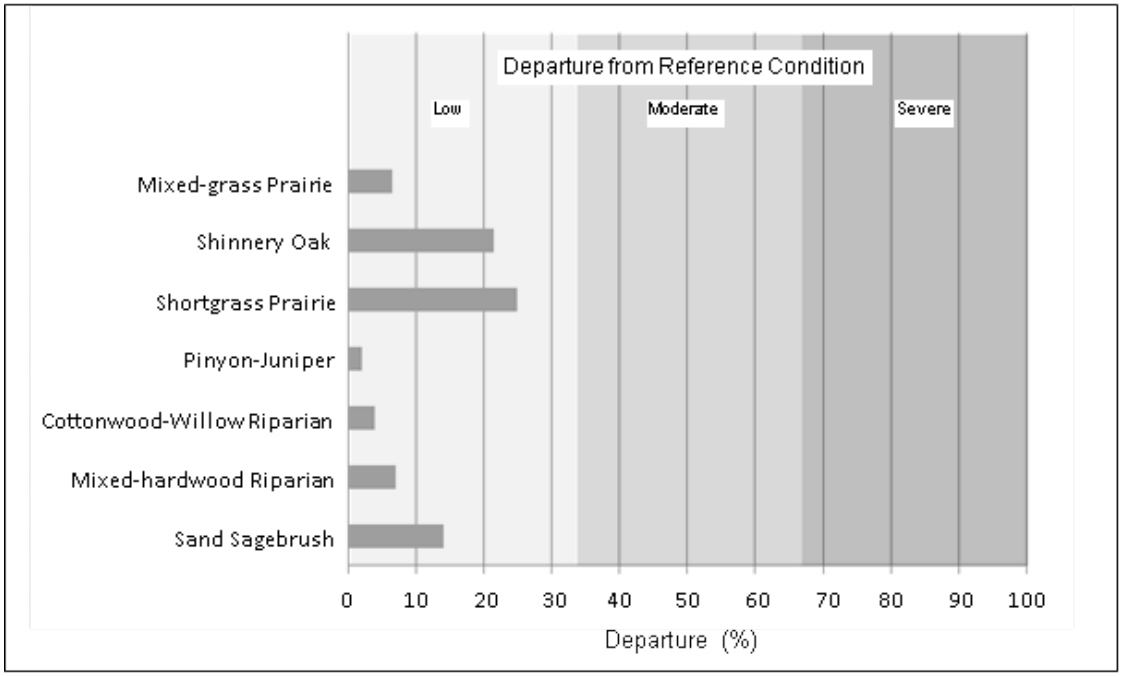


**Figure 1. Departure of current condition vegetation structure from reference condition vegetation structure**

In order to insure that viable populations will be maintained, habitat must be provided to support, at least, a minimum number of reproductive individuals and that habitat must be well distributed so that those individuals can interact with others in the planning area. Vegetation types on the Grasslands are all in low departure from their respective reference condition for vegetation structure, and habitat for the associated species is well distributed. The basis for determining the use of an ecological indicator over selecting a management indicator species is derived from this premise.

### Team Evaluation and Discussion

The discussion comments concerning a species or vegetative composition and structure including a discussion of known habitat associations is recorded in the following tables.

**Table 1. Black Kettle and McClellan Creek species and vegetation habitat association**

| Scientific Name | Common Name | | Comments |
|---|---|---|---|
| **Mixed-grass Prairie** | | | |
| *Asio flammeus* | Short-eared Owl | Bird | Not selected |
| *Coccyzus americanus* | Yellow-billed Cuckoo | Bird | Not in mixed-grass |
| *Colinus virginianus* | Northern Bobwhite | Bird | Consider to add as MIS |
| *Lanius ludovicianus* | Loggerhead Shrike | Bird | Not selected |
| *Aimophila cassinii* | Cassin's Sparrow | Bird | Probably not well represented on mixed-grass but better on sand sagebrush RB |
| *Ammodramus savannarum* | Grasshopper Sparrow | Bird | Consider further |
| **Mixed Hardwood Riparian** | | | |
| *Egretta caerulea* | Little Blue Heron | Bird | Not selected |
| *Melanerpes erythrocephalus* | Red-headed Woodpecker | Bird | Not selected |
| *Coccyzus americanus* | Yellow-billed Cuckoo | Bird | Not selected |
| *Meleagris gallopavo intermedia* | Rio Grande Turkey | Bird | Retain because turkey utilizes the habitat |
| *Picoides villosus* | Hairy Woodpecker | Bird | Not a better choice over turkey |
| *Tyrannus forficatus* | Scissor-tailed Flycatcher | Bird | Not a better choice over turkey |
| *Vireo bellii* | Bell's Vireo | Bird | Low population concern not selected |
| *Zenaida macroura* | Mourning Dove | Bird | Not selected |
| **Shinnery Oak** | | | |
| *Ammodramus savannarum* | Grasshopper Sparrow | Bird | Not selected for shinnery |
| *Colinus virginianus* | Northern Bobwhite | Bird | Consider as MIS |
| *Meleagris gallopavo intermedia* | Rio Grande Turkey | Bird | Not a better choice over Northern Bobwhite quail |
| *Tympanuchus pallidicinctus* | Lesser Prairie-chicken | Bird | Low population concern not selected |
| *Zenaida macroura* | Mourning Dove | Bird | Not selected |
| *Odocoileus virginianus* | White-tailed deer | Mammal | Not selected |
| *Holbrookia maculata* | Common lesser earless lizard | Reptile | Not selected monitoring issue |
| **Aquatic Lakes, Rivers** | | | |
| *Rana blairi* | Plains leopard frog | Amphibian | Management has no effect |
| *Lepomis cyanellus* | Green sunfish | Fish | Management has no effect |

**Table 1. Black Kettle and McClellan Creek species and vegetation habitat association**

| Scientific Name | Common Name | | Comments |
|---|---|---|---|
| *Micropterus salmoides salmoides* | Largemouth bass | Fish | Management has no effect |
| *Phenacobius mirabilis* | Suckermouth minnow | Fish | Management has no effect |
| *Notropis girardi* | Arkansas River shiner | Fish | Management has no effect |
| *Sternula antillarum athalassos* | Interior Least Tern | Bird | Management has no effect |

**Table 2. Kiowa and Rita Blanca species, vegetation, and habitat**

| Scientific Name | Common Name | | Comments |
|---|---|---|---|
| **Aquatic Lakes, Ponds and Playas, Rivers, and Other Wetlands** | | | |
| *Haliaeetus leucocephalus* | Bald Eagle | Bird | Not selected |
| *Plegadis chihi* | White-faced Ibis | Bird | Not breeding and not a winter resident |
| *Rana blairi* | Plains leopard frog | Amphibian | Drought has more influence than management |
| *Phalaropus tricolor* | Wilson's Phalarope | Bird | Not breeding and not a winter resident |
| *Recurvirostra Americana* | American Avocet | Bird | Not selected |
| *Orconectes deanae* | Conchas crayfish | Crustacean | Not selected |
| *Succinea vaginacontorta* | Ambersnail | Snail | Not selected |
| **Cottonwood-Willow Riparian** | | | |
| *Melanerpes erythrocephalus* | Red-headed Woodpecker | Bird | Not selected |
| *Haliaeetus leucocephalus* | Bald Eagle | Bird | Not selected |
| *Poanes hobomok wetona* | Hobomok skipper | Insect | Not selected |
| *Odocoileus virginianus texana* | Sandhill whitetail deer | Mammal | Not selected |
| *Rana blairi* | Plains leopard frog | Amphibian | Not selected |
| *Gastrophryne olivacea* | Great Plains narrow-mouthed toad | Amphibian | Grassland pools of water |
| *Thamnophis proximus diabolicus* | Arid land ribbon snake | Reptiles | Present but not an indicator of C/W and management |
| *Coccyzus americanus* | Yellow-billed Cuckoo | Bird | Not detected on Grasslands breeding bird surveys |
| *Guiraca caerulea* | Blue Grosbeak | Bird | Consider definitely riparian species, utilize shrub component |

**Table 2. Kiowa and Rita Blanca species, vegetation, and habitat**

| Scientific Name | Common Name | | Comments |
|---|---|---|---|
| *Piranga rubra* | Summer Tanager | Bird | Consider less adaptable to tamarisk and use the C/W trees utilize regenerating C/W |
| *Passerina cyanea* | Indigo Bunting | Bird | Consider less adaptable to tamarisk and use the C/W trees utilize regenerating C/W utilize the shrubby component |
| **Sand Sagebrush** | | | |
| *Ammodramus savannarum* | Grasshopper Sparrow | Bird | Possibly retain |
| *Aimophilia cassinii* | Cassin's Sparrow | Bird | Consider perch on shrubs and nest or display, boom/bust population. Need population trends over long time. |
| *Callipepla squamata* | Scaled Quail | Bird | Generalist, uses multiple habitat types |
| *Tympanuchus pallidicinctus* | Lesser Prairie-chicken | Bird | Population is very low as a choice for MIS |
| *Cynomys ludovicianus ludovicianus* | Black-tailed prairie dog | Mammal | Not an indicator of good sand sagebrush habitat |
| *Poladryas minuta minuta* | Dotted checkerspot | Insect | Not selected |
| *Paraidemona fratercula* | A grasshopper | Insect | Not selected |
| *Lanius ludovicianus* | Loggerhead Shrike | Bird | Difficult to detect and declining, loss of transitional habitat going from pinyon-juniper to grassland to nest, not selected |
| **Shortgrass Prairie** | | | |
| *Poladryas minuta minuta* | Dotted checkerspot | Insect | Not selected |
| *Polites origenes rhena* | Rhena crossline skipper | Insect | Not selected |
| *Ammodramus bairdii* | Baird's Sparrow | Bird | Doesn't breed on the KRB NGs but may winter over rarely. |
| *Ammodramus savannarum* | Grasshopper Sparrow | Bird | Concurred to consider within mixed-grass inclusion |
| *Aquila chrysaetos* | Golden Eagle | Bird | Not selected |
| *Asio flammeus* | Short-eared Owl | Bird | Breed further north |
| *Athene cunicularia hypugaea* | Burrowing Owl | Bird | Propose adding as MIS present and good data available, data specific to Kiowa on BO |

**Table 2. Kiowa and Rita Blanca species, vegetation, and habitat**

| Scientific Name | Common Name | | Comments |
|---|---|---|---|
| *Buteo regalis* | Ferruginous Hawk | Bird | Concurred to consider Grasslands indicator |
| *Buteo swainsoni* | Swainson's Hawk | Bird | Generalists not necessarily tied to shortgrass |
| *Calamospiza melanocorys* | Lark Bunting | Bird | Would use more shrub component, not selected |
| *Callipepla squamata* | Scaled Quail | Bird | May need more shrub and structure |
| *Charadrius montanus* | Mountain Plover | Bird | Research and determine if we have population data to justify, look for early season survey. |
| *Haliaeetus leucocephalus* | Bald Eagle | Bird | Near alkali lake and near BTPD on RB not selected more generalist compared to Ferruginous Hawk |
| *Numenius americanus* | Long-billed Curlew | Bird | Concurred to consider |
| *Vulpes velox* | Swift fox | Mammal | Obligate to shortgrass, monitoring issue for occurrence, independent from BTPD although can use the same areas |
| *Odocoileus hemionus* | Mule deer | Mammal | Not selected |
| *Cynomys ludovicianus ludovicianus* | Black-tailed prairie dog | Mammal | Presence or absence of BTPD has more variables than Grasslands vegetation management |
| *Antilocapra Americana* | Pronghorn | Mammal | Not selected |
| **Pinyon-Juniper** | | | |
| *Buteo albonotatus* | Zone-tailed Hawk | Bird | Outside of its territory |
| *Thryomanes bewickii* | Bewick's Wren | Bird | Generalist nester not specific enough for pinyon-juniper MIS dense shrubs in open areas in pinyon-juniper |
| *Myiarchus cinerascens cinerascens (NM)* | Ash-throated Flycatcher | Bird | Generalist for habitat cavity nester consistently shows up in survey, not selected |
| *Baeolophus ridgwayi* | Juniper Titmouse | Bird | Not consistently present NM CWCS more selective for old growth cavities juniper only, declining population |
| *Vireo vicinior* | Gray Vireo | Bird | Discussion concluded not |

**Table 2. Kiowa and Rita Blanca species, vegetation, and habitat**

| Scientific Name | Common Name | | Comments |
|---|---|---|---|
| | | | documented on Kiowa |
| *Sialia currucoides* | Mountain Bluebird | Bird | Cavity nester indicative of all succession stages of pinyon-juniper consider for MIS |

**Table 3. Kiowa and Rita Blanca ecological indicator discussion**

| Species, Landform or Vegetation | Description | Issues |
|---|---|---|
| Playa Lakes | Desired condition soils are mostly stable, although some wind erosion occurs. Vegetation, when sufficient moisture is present, consists of mesic-adapted species such as various annuals, milkweeds, western wheatgrass, and inland saltgrass, with incidental occurrence of upland shortgrass species.<br>Playa lakes are connected to overland waterflows from the adjacent watershed during the periodic and natural inundation of the bottoms to support their inherent ecological qualities and hydrologic functions, and to provide for wildlife habitat. When playas hold water, there is an increase in the shoreline vegetative diversity and density, and an increase in the extent of mudflat habitat for migratory waterfowl and shorebirds. Also during this time, they support aquatic life harboring a variety of vertebrate and invertebrate lifeforms.<br>The integrity of the clay seals of playas is maintained and free from human influence. Playas altered through the construction of dugout pits are restored to their natural hydrologic function. | Probably does not fit ecological indicator/unique or special habitat.<br>Vegetation in playas is dominated by annual plants such as barnyard grass and saltmarsh aster, also a lot of overlap of plants subject to moisture conditions.<br>Bottom of the watershed if silted makes the hydroperiod cycles shorter.<br>Invertebrate population indicative of hydroperiod cycles, not of management.<br>Taller structure when playa is dry would attract species that select that condition. Grazing will impact structure and reduce height. |
| Sand Sagebrush | Desired conditions in sand sagebrush vegetation are consistent with providing habitat for associated species. Areal extent of the vegetation boundary and composition and structure changes are indicative of habitat loss. | Consider an ecological indicator. This approach provides the areal extent of the sand sagebrush vegetation through satellite imagery along with frequency and trend data monitoring to evaluate the vegetation. Pre Dust Bowl era plowing eliminated the sand sagebrush plant community in some areas. These areas have not recovered the structure and composition of sand sagebrush and some areas have been colonized by black-tailed prairie dogs. |

**Table 3. Kiowa and Rita Blanca ecological indicator discussion**

| Species, Landform or Vegetation | Description | Issues |
|---|---|---|
| Cottonwood-Willow Riparian Canadian River | Desired conditions in this riparian community lists invasive trees such as saltcedar as undesirable. Evaluating the vegetation through the success of bird species that use any shrub or tree component does not provide an indication of management success toward desired conditions. | Consider presence of undesirable woody vegetation such as saltcedar as the ecological indicator of trends toward desired vegetation structure and species composition. This approach gets to our alternative desires and helps analyze our alternative without the ambiguity of a MIS in this habitat. This EI not complicated to monitor and helps meet desired conditions in this vegetation type. |
| Lesser Prairie-chicken | Narrow range of ecological tolerance. | Indication of change tied to a habitat type. Currently vegetation is managed for structure and composition. Population is very isolated and inconsistent to gauge management. |

**Table 4. Black Kettle and McClellan Creek ecological indicator discussion**

| Landform or vegetation | Description | Issues |
|---|---|---|
| Shinnery Oak and Mixed-grass Prairie | Trees in upland settings anywhere they are invasive and alter composition and structure of the vegetation are undesirable. Invasive tree species to include some native in undesirable areas. Use undesirable species to describe targeted species or individuals. | Consider the areal extent of undesirable trees as the ecological indicator of desired vegetation structure and species composition. This approach gets to our alternative desires and helps analyze our alternative without the expense or commitment of using a MIS. Monitoring is not expensive or complicated and helps meet LPC objectives. |

**Table 5. Summary of management indicator species team discussion**

| *Species* | Common Name | | | Habitat | Issues and Conclusion |
|---|---|---|---|---|---|
| *Sialia currucoides* | Mountain Bluebird | Bird | 1 | Pinyon-Juniper | Selected as Grassland plan MIS for pinyon-juniper woodland. The Mountain Bluebird is a cavity nester that is indicative of all seral stages of pinyon-juniper. It is easy to detect and is present on existing breeding bird survey (BBS) routes on the Kiowa NG. |
| *Guiraca caerulea* | Blue Grosbeak | Bird | | Cottonwood-Willow Riparian | Not selected. Occurs in streamside shrubby habitat including tamarisk. It also occupies shrubby habitats in the uplands. Achieving the |

**Table 5. Summary of management indicator species team discussion**

| *Species* | Common Name | | | Habitat | Issues and Conclusion |
|---|---|---|---|---|---|
| | | | | | desired condition for the cottonwood-willow vegetation type requires removal of undesirable woody species, such as tamarisk, which is used by this species. Blue Grosbeak would not represent desired vegetation structure and species composition that calls for undesirable woody species removal, including tamarisk. This is a species which is non-selective of shrub species component. |
| *Piranga rubra* | Summer Tanager | Bird | | Cottonwood-Willow Riparian | Not selected. The Summer Tanager is less adaptable to tamarisk and utilizes regenerating cottonwood-willow habitat. A major issue in the Canadian River/Mills Canyon area is a lack of overland flooding which would allow the regeneration of cottonwood and willow. Until sustainable cottonwood and willow stands are reestablished through restoration plantings and flooding, habitat for Summer Tanager is marginal. Thus, due to lack of management influence on specific habitat for this species, Summer Tanager would not serve well as a MIS. |
| *Passerina cyanea* | Indigo Bunting | Bird | | Cottonwood-Willow Riparian | The Indigo Bunting is found in desert riparian deciduous woodlands, marshes, and along rivers or desert streams that provide sufficient moisture for a narrow band of trees and shrubs along the margins.<br>A major issue in the Canadian River/Mills Canyon area is a lack of overland flooding which would allow the regeneration of cottonwood and willow. Until sustainable cottonwood and willow stands are reestablished through restoration plantings and flooding, habitat for Indigo Bunting is marginal. Thus, due to lack of management influence on specific habitat for this species, Indigo Bunting would not serve well as a MIS. |
| *Athene cunicularia hypugaea* | Burrowing Owl | Bird | 2 | Shortgrass Prairie | Selected as Grassland plan MIS for shortgrass prairie. The Burrowing Owl represents the presence, distribution, and size of BTPD colonies. Good data is available for the KRB NGs from New Mexico State University and New Mexico Department of Game and Fish (NMDGF). It is easy to detect. |
| *Numenius americanus* | Long-billed Curlew | Bird | | Shortgrass Prairie | Breeding grounds of the curlew are determined by range condition, where it normally nests in an area where vegetation is green and plentiful. The diet is mainly insectivorous and mostly consists of grasshoppers.<br>There are three breeding bird surveys on the |

**Table 5. Summary of management indicator species team discussion**

| *Species* | Common Name | | | Habitat | Issues and Conclusion |
|---|---|---|---|---|---|
| | | | | | KRB NGs. Two of those routes occur in habitat suitable for long-billed curlew occupancy, and have detected LBC, those transects being the Mills Canyon BBS where the curlew was located once and the Sauz Creek BBS where the curlew has been located three times.<br>Because neotropical migrants such as the Long-billed Curlew can be nomadic, and due to the large number of factors that can affect these birds on any given year, it may take many years of survey to determine whether or not a Grasslands-level trend can be detected for this species. Therefore, this species was not selected. |
| *Ammodramus savannarum* | Grass-hopper Sparrow | Bird | | Shortgrass Prairie, Mixed-grass Prairie | Limiting factors for Grasshopper Sparrow appear to be vertical structure in the form of yucca, native shrubs, or scattered trees, etc., to provide key habitat components for singing territorial males. This species tends to avoid areas with greater than 35 percent shrub cover. Intermediate grass height is preferred.<br>Not selected as MIS. Grasshopper Sparrow winters in areas outside of the Grasslands range of influence and is too general in its habitat needs. |
| *Meleagris gallopavo intermedia* | Rio Grande Turkey | Bird | 3 | Mixed Hardwood Riparian | The Rio Grande Turkey was retained as MIS. In the 1985 forest plan, the turkey is MIS for eastern riparian habitat. Rio Grande Turkey habitat is well represented by abundant roosting trees and areas available for foraging and nesting in the understory of the mixed hardwood riparian habitat type. It is easy to detect. |
| *Ammodramus savannarum* | Grass-hopper Sparrow | Bird | | Sand Sagebrush | This species avoids the sand sagebrush habitat type because it prefers areas with less shrub cover and uses the taller grass component of sand sagebrush.<br>Not selected as MIS. Desired sand sagebrush vegetation structure would not be representative of Grasshopper Sparrow habitat. |
| *Aimophilia cassinii* | Cassin's Sparrow | Bird | | Sand Sagebrush | Cassin's Sparrow exhibits yearly fluctuations in distribution and numbers at any particular location, apparently in response to precipitation. These fluctuations hamper a clear assessment of population status.<br>Cassin's Sparrow was not chosen as a MIS. |
| *Colinus virginianus* | Northern Bobwhite | Bird | | Shinnery Oak, Mixed- | NBW has generalist habitat needs that are not specific to indicate management influence. |

**Table 5. Summary of management indicator species team discussion**

| *Species* | Common Name | | | Habitat | Issues and Conclusion |
|---|---|---|---|---|---|
| | | | | grass Prairie | This species is in decline nationally with no known cause, therefore, this species was not selected. |

**Table 6. Summary of team MIS and EI discussion**

| Ecological Indicators | |
|---|---|
| Areal extent of undesirable trees in shinnery oak and mixed-grass prairie | Propose as ecological indicator because this approach gets to preferred alternative desired conditions and eases the process to analyze plan alternatives. This EI is easy to monitor and helps meet LPC objectives. |
| Shortgrass prairie spatial analysis of the areal extent of plant communities | Propose as ecological indicator because this approach gets to preferred alternative desired conditions and eases the process to analyze plan alternatives. Mid- and late-successional shortgrass prairie on the Kiowa and Rita Blanca NGs would use the range vegetation trends as the ecological indicator. |
| Sand sagebrush spatial analysis of the areal extent of plant communities | Propose as ecological indicator because this approach gets to preferred alternative desired conditions and eases the process to analyze plan alternatives. All successional stages of sand sagebrush on the Kiowa and Rita Blanca NGs would use the range vegetation trends as the ecological indicator. |
| Cottonwood-willow riparian | Propose that presence of undesirable woody species, such as saltcedar, will serve as the ecological indicator for the cottonwood-willow riparian vegetation type in the Canadian River of the Mills Canyon Management Area. Reduction in saltcedar indicates trend or movement toward desired condition and management success. |

### Monitoring

The monitoring protocol is a plan component that includes a discussion of data collection, data analysis, data storage, and reporting methods. This protocol covers frequency of measurement, expected precision and reliability of the system, and an indication of when the evaluation will be reported (1982 Rule Provision 219.12(k)). Table 7 summarizes the monitoring frequency and measures.

**Table 7. Monitoring frequency and measures**

| Black Kettle and McClellan Creek Management Area Vegetation Types Represented by Ecological Indicators | |
|---|---|
| **Mixed-grass Prairie Ecological Indicator (areal extent of undesirable trees)**<br>The mixed-grass prairie vegetation type is in low departure from reference condition for vegetation structure. Monitoring the existence and encroachment of undesirable woody species, such as eastern redcedar and black locust, will serve as the ecological indicator and will indicate management influence. | |
| **Scale** | **Monitoring Frequency and Measure** |
| Black Kettle and McClellan | Annual<br>Document undesirable tree treatment and postfire mortality. |

| | |
|---|---|
| Creek | Change in species composition within burned areas.<br>Document planned or unplanned fire occurrences. |
| **Shinnery Oak and Deep Plowed Inclusion Ecological Indicator (areal extent of undesirable trees)**<br>The shinnery oak vegetation type is in low departure from reference condition for vegetation structure. Monitoring the existence and encroachment of undesirable woody species, such as eastern redcedar and black locust, will serve as the ecological indicator and will indicate management influence. | |
| **Scale** | **Monitoring Frequency and Measure** |
| Black Kettle | Annual<br>Document undesirable tree treatment and postfire mortality.<br>Change in species composition within burned areas.<br>Document planned or unplanned fire occurrences. |
| **Black Kettle and McClellan Creek Management Area Vegetation Types Represented by Management Indicator Species** | |
| **Mixed Hardwood Riparian**<br>*Meleagris gallopavo intermedia*, Rio Grande Turkey, represents a species that utilizes all successional stages of mixed hardwood riparian and will serve as the management indicator species for this vegetation type. | |
| **Scale** | **Monitoring Frequency and Measure** |
| Black Kettle | Annual<br>Use breeding bird survey to monitor *Meleagris gallopavo intermedia*; Rio Grande Turkey as a management indicator species. |
| **Kiowa and Rita Blanca Management Area Vegetation Types Represented by Ecological Indicators** | |
| **Shortgrass Prairie Mid- and Late-Successional Stages** | |
| **Scale** | **Monitoring Frequency and Measure** |
| Kiowa and Rita Blanca | Every 5 years<br>The ecological indicator of mid- and late-successional shortgrass prairie will be determined by spatial analysis of the areal extent of plant communities. Mid- and late-successional shortgrass prairie will be monitored for range vegetation trends based on the area within the proclaimed boundary of the Kiowa and Rita Blanca National Grasslands.<br>Document planned or unplanned fire occurrences.<br>Document vegetation composition and structure for different successional stages, including mesic or xeric areas. |
| **Sand Sagebrush** | |
| **Scale** | **Monitoring Frequency and Measure** |
| Kiowa and Rita Blanca | Every 5 years<br>The ecological indicator of sand sagebrush will be determined by spatial analysis of the areal extent of plant communities. Sand sagebrush will be monitored for range vegetation trends based on the area within the proclaimed boundary of the Kiowa and Rita Blanca National Grasslands.<br>Document planned or unplanned fire occurrences. |

| **Cottonwood/Willow Ecological Indicator (Presence of Undesirable trees)**<br>The presence of undesirable woody species, such as saltcedar, will serve as the ecological indicator for the cottonwood-willow riparian vegetation type in the Canadian River of the Mills Canyon Management Area. Reduction in saltcedar indicates trend or movement toward desired condition and management success. | |
|---|---|
| **Scale** | **Monitoring Frequency and Measure** |
| Kiowa and Rita Blanca | Monitor 3-5 years.<br>Document undesirable tree treatment. |
| **Kiowa and Rita Blanca Management Area Vegetation Types Represented by Management Indicator Species** | |
| **Pinyon-Juniper and Juniper Grasslands**<br>*Sialia currucoides*, Mountain Bluebird represents a species that utilizes all successional stages of pinyon-juniper and will serve as the management indicator species for pinyon-juniper. | |
| **Scale** | **Monitoring Frequency and Measure** |
| Kiowa | Annual<br>Use breeding bird survey to monitor *Sialia currucoides*; Mountain Bluebird as a management indicator species. |
| **Shortgrass Prairie Early Successional Stages on Kiowa and Rita Blanca National Grassland**<br>Burrowing Owl represents the presence and expansion of black-tailed prairie dog colonies. Early successional shortgrass prairie on the Kiowa and Rita Blanca National Grasslands associated with black-tailed prairie dogs will use management indicator species *Athene cunicularia hypugaea* or Burrowing Owl. | |
| **Scale** | **Monitoring Frequency and Measure** |
| Kiowa and Rita Blanca | Annual<br>Early successional shortgrass prairie on the Kiowa and Rita Blanca National Grasslands associated with black-tailed prairie dogs will be monitored through the use of breeding bird surveys to track *Athene cunicularia hypugaea* or Burrowing Owl as a management indicator species. |

### Summary Narrative

Monitoring Burrowing Owl, Mountain Bluebird, and Rio Grande Turkey populations as management indicator species allows trend information to be used to evaluate management direction on early successional stages of shortgrass prairie, all seral stages of pinyon-juniper, and all seral stages in mixed hardwood riparian respectively.

Monitoring the presence of undesirable woody species in cottonwood-willow riparian, shinnery oak, and mixed-grass prairie vegetation, and range vegetation frequency and trends on mid- and late-structural stages of shortgrass prairie, and all successional stages of sand sagebrush allows trends information to be used as ecological indicators to evaluate management direction.

# Appendix H. Grazing Suitability/Recreation Suitability

## Grazing Suitability

### Grazing Suitability and Capability

The 1982 Planning Rule provisions require that the suitability and capability of National Forest System (NFS) lands for producing forage for grazing and browsing animals be determined in forest planning. Suitability is the appropriateness of producing certain goods or services from, or applying certain resource management practices to, a particular area of land in consideration of the relevant social, economic, and ecological factors. Suitability is determined based on compatibility with desired conditions and objectives in the plan area, including wildlife habitat needs. The identification of an area as suitable for various uses is guidance for project and activity decisionmaking, and is not a commitment or a final decision approving projects and activities. For example, the identification of lands suitable for livestock grazing within the revised plan is not a decision to authorize livestock grazing: the final decision to authorize livestock grazing would be made at the project (allotment) level.

The 1985 "Cibola National Forest Land and Resource Management Plan" (LRMP), as amended, is the starting point for identifying suitability of land use on the Kiowa, Rita Blanca, Black Kettle, and McClellan Creek National Grasslands (herein referred to as the "Grasslands"). The analysis and subsequent identification of lands as suitable for livestock grazing is carried forward from that plan as the existing suitability determination. No need for change was identified.

Capability of Cibola National Forest (NF) and National Grasslands (NGs) lands to produce forage was determined in the 1980s as part of forest planning. Capability is the potential of an area of land to produce resources and supply goods and services. It depends upon site conditions such as climate, slope, landform, soils, and geology. Most of these landscape-scale conditions have not changed significantly since then, therefore, capability determined in the 1985 LRMP are likely still at the strategic planning level, but should be considered when making project level decisions.

### Background

Within the summary of the analysis of the management situation, the 1985 LRMP (as amended) determined that the goal of range management on the Cibola National Forest and National Grasslands was to provide forage for domestic livestock use under cost-efficient management systems without impairment of land productivity or other resource needs. Of the 317 Grassland grazing units, 99 percent were in the moderately high condition class and most were stocked within established carrying capacities; no major problems were identified. Grassland use totals were 68,783 animal unit months (AUMs) with a capacity estimated at 82,829 AUMs. The anticipated future trend was for improved range conditions except areas ecologically suited for shinnery oak, which without control, would decline for domesticated livestock use, but remain important as wildlife browse, mast, and cover.

### Current Condition

Over 96 percent of the Grasslands are used by permit holders to graze their cattle. Livestock are excluded from developed recreation areas, administrative sites, research sites, and exclosures designed to protect various resource values. There is no indication that there will be a major increase or decrease in grazing on the Grasslands over the next 20 years; however, cattle numbers

and management strategies are expected to fluctuate in response to drought, wildfire, prescribed fire, and other factors that change range conditions.

Annual range monitoring has shown that annual fluctuations in weather patterns continue to be the most frequent reasons for adjusting grazing management strategies through adaptive management processes. Monitoring is done on an annual basis and reports can be found at http://www.fs.fed.us/r3/cibola/projects/index.shtml

### Kiowa and Rita Blanca National Grasslands

Rangeland management environmental assessments (EAs) were completed for the Kiowa and Rita Blanca (KRB) NGs in 1998, 1999, 2002, 2003, and 2005 wherein the decision was made to authorize livestock grazing, implement term grazing permits, and establish parameters for all livestock management operations. Production and utilization of range forage are emphasized, and range activities are compatible with wildlife habitat needs. In 2008, more than 90 percent of the allotments on the KRB NGs were monitored for use and condition. Monitoring indicated low forage production due to reduced summer precipitation combined with cumulative effects of below normal rainfall in preceding years ("Cibola National Forest and Grasslands Monitoring and Evaluation Report," 2008). The majority of rangelands are in satisfactory range condition. There is minimal noncapable rangeland in this management area; marshes, lakes, developed recreation, and administrative sites were not included or considered in the capability analysis. Mills Canyon is the only area on the KRB NGs that has extensive areas of noncapable rangelands, which is found on slopes that exceed 40 percent. Exact acreage of noncapable rangelands has not been computed (Kiowa and Rita Blanca Geographic Area Assessment v.1, 1999).

### Black Kettle and McClellan Creek National Grasslands

In 1998 an EA was completed to assist in the analysis and documentation of vegetation management direction on the Black Kettle (BK) National Grassland (NG). The decision was made to authorize livestock grazing using adaptive resource management. Management emphasis is on production and utilization of range forage for domestic livestock. Range activities will be compatible with wildlife needs. The area is in satisfactory or higher rangeland condition, i.e. those lands that have sufficient vegetative cover to protect the soil resource and provide a sustainable base for desired plant and animal communities and where current soil loss is less than tolerance soil loss. Two units and a portion of a third were identified in the 1998 EA to be managed as ungrazed research/monitoring sites; stocking rates were reduced on one unit. In 2008, BK monitored 93 percent of their allotments, and all met or exceeded desired conditions ("Cibola National Grasslands Monitoring and Evaluation Report," 2008). There are about 938 acres of noncapable rangelands located in marshes, lakes, oil and gas locations, developed recreation sites, and fenced public road rights-of-way. According to the 1998 environmental assessment, 29,800 acres are considered suitable for livestock grazing on the BK NG. A review of the EA as directed by Forest Service Handbook (FSH) 1909.15, Chapter 10, Section 18, is currently underway.

#### Lake Marvin

Lake Marvin is not currently an active range allotment although grazing may be allowed as a vegetation management tool in accordance with desired conditions. All capable lands are in satisfactory range condition. Noncapable lands include about 40 acres of surface water (lake) and about 50 acres of wetland.

### McClellan Creek

Lake McClellan is not currently an active range allotment, although grazing may be allowed as a vegetation management tool in accordance with desired conditions. All capable lands are in satisfactory condition. Noncapable lands include about 380 acres of surface water (lake) and bluff. Table 1 summarizes livestock grazing suitability.

**Table 1. Livestock grazing - Black Kettle, McClellan Creek, Kiowa, and Rita Blanca National Grasslands**

| Area | Suitable | Not Suitable |
|---|---|---|
| General Grasslands | X | |
| Slopes over 40 percent | | X |
| Developed recreation areas | | X |
| Administrative sites, research sites, exclosures designed to protect resource values | | X |
| Areas with “no grazing” decisions | | X |
| Areas with soil condition of unsuited or inherently unstable soil function | | X |
| Areas not currently within an allotment | X | |

## Vegetation, Wildlife, and Socioeconomic Uses

Areas deemed suitable for livestock grazing do not preclude the ability to manage those areas to achieve desired conditions for vegetation and wildlife. Livestock grazing is permitted under term permits that include allotment management plans and annual operating instructions that identify adaptive management strategies including flexible stocking rates related to season of use. Adaptive management addresses the ability of Grassland ecosystems to be resilient to variations in precipitation, fire, catastrophic insect infestations, and other periodic natural disturbances. Wildlife benefits from increased plant productivity and vigor as well as increased plant diversity. Management of individual units allows vegetation to be manipulated to trend toward desired vegetation structure and species composition.

The Grasslands have been identified as suitable for livestock grazing; however social and economic impacts may result from changes in timing and frequency of grazing use due to fluctuations in annual weather patterns.

## Supporting References

“Cibola National Forest, Land and Resource Management Plan,” (amended), USDA Forest Service, Cibola National Forest, 1985

“Cibola National Forest and Grasslands, 2008 Monitoring and Evaluation Report,” USDA Forest Service, Cibola National Forest, July 2009

“Environmental Assessment, Livestock Grazing and Associated Vegetation Management, Black Kettle National Grassland, Roger Mills County, Oklahoma,” USDA Forest Service, Cibola National Forest, Black Kettle Ranger District, August 1998

"Environmental Assessment for Consolidated Grazing Allotments in Dallam County, Texas," USDA Forest Service, Cibola National Forest, Rita Blanca National Grassland, March 2005

"Environmental Assessment for Selected Grazing Allotments in Dallam County, Texas," USDA Forest Service, Cibola National Forest, Rita Blanca National Grassland, November 2003

"Livestock Grazing in the Mills Area of the Kiowa National Grassland," USDA Forest Service, Cibola National Forest, Kiowa National Grassland, August 1998

"Livestock Grazing on the Kiowa National Grassland in Union County, New Mexico," USDA Forest Service, Cibola National Forest, Kiowa National Grassland, August 1999

"Livestock Grazing and Management on the Rita Blanca National Grassland in Cimarron County, Oklahoma," USDA, Forest Service, Cibola National Forest, Rita Blanca National Grassland, September 2002

"Kiowa and Rita Blanca National Grasslands, Geographic Area Assessments, v.1, 1999," USDA Forest Service, Cibola National Forest

"Black Kettle and McClelland Creek National Grasslands, Geographic Area Assessments, v.1, 2000," USDA, Cibola National Forest

# Recreation Suitability

## Background

The 1982 Planning Rule provisions require that the suitability of National Forest System lands for recreation opportunities be determined in forest planning. Suitability is the appropriateness of producing certain goods or services from or applying certain resource management practices to a particular area of land in consideration of relevant social, economic, and ecological factors. Suitability is determined based on compatibility with desired conditions and objectives in the plan area. The identification of an area as suitable for various uses is guidance for project and activity decisionmaking and is not a commitment or a final decision approving projects and activities.

## Recreation Supply

For planning purposes, recreation supply is defined as the opportunity to participate in an outdoor recreation activity in a preferred setting to realize desired and expected experiences. Recreationists choose to participate in an activity within a setting to optimize a desired experience. Three components of recreation supply are activities, settings, and facilities. The U.S. Forest Service manages a supply of settings and facilities. The Recreation Opportunity Spectrum (ROS) is a planning tool used to identify the supply of recreation settings on national forests in support of diverse recreation activities. ROS includes seven possible setting classifications. Under alternative A, only two were assigned on the KRB NGs and BKMC NGs. They are roaded natural (RN) and semiprimitive motorized (SPM). Alternatives B and C include these classes, but add two more: semiprimitive nonmotorized (SPNM) and rural (R). See the "Recreation Opportunity Spectrum Maps" in appendix A of the draft Grasslands plan.

*Roaded natural* (RN) settings are natural appearing with moderate evidence of sights and sounds of humans. Interaction between visitors may be low to moderate, but evidence of other users is prevalent. Conventional motorized access is accommodated. RN areas are located within a half

mile of a road and usually provide higher levels of development such as campgrounds, picnic areas, and access points for dispersed uses such as trailheads. Under current management, about half of the Grasslands are classified as roaded natural.

*Semiprimitive motorized* (SPM) areas are natural or natural appearing. Interaction between visitors is low, but there often is evidence of other users. Motorized use is permitted. Under current management, about half of the Grasslands are classified as semiprimitive motorized.

*Semiprimitive nonmotorized* (SPNM) areas are predominated by a natural or natural appearing environment. Interaction between visitors is low, but there may be evidence of other users. They are managed to achieve a sense of remoteness, although SPNM areas can be as small as 2,500 acres in size and only a half-mile or greater from any open road. These areas are managed to minimize the presence of onsite controls and restrictions. These settings accommodate dispersed, nonmotorized recreation.

*Rural* (R) settings are substantially modified natural environments. Sights and sounds of other humans are readily evident and interaction between users may be moderate to high. On the Grasslands, this classification is not associated with typical recreation settings.

The ROS acreages proposed for each alternative by district follow. The acreages for alternative A are current and represent those assigned in the 1985 plan. The acreages for alternatives B and C were compiled recently as part of the planning process. Due to changes in land ownership, mapping technology, and rounding the total acreage between alternative A and alternatives B and C will vary slightly. We recalculated the ROS acreages on KRB (02/16/12) for alternatives B and C to reflect the addition of RN acres in Mills Canyon to provide access to the “Rock Table” dispersed site on Umil011 within the IRA exclusion. We also recalculated all other ROS acres for alternative C. That recalculation resulted in reduced RN and SPM acres, and increased SPNM acres where Road 600 crosses the river.

**Table 2. Current and proposed distributions of ROS classes, Black Kettle and McClellan Creek National Grasslands (acres)**

| | Semiprimitive Nonmotorized | Semiprimitive Motorized | Roaded Natural | Rural |
|---|---|---|---|---|
| Alternative A (current) | 0 | 3,583 | 29,529 | 0 |
| Alternative B | 0 | 28,695 | 4,064 | 36 |
| Alternative C | 0 | 28,695 | 4,064 | 36 |

Source: Cibola National Forest and Grasslands GIS inventory data

**Table 3. Current and proposed distributions of ROS classes, Kiowa and Rita Blanca National Grasslands (acres)**

| | Semiprimitive Nonmotorized | Semiprimitive Motorized | Roaded Natural | Rural |
|---|---|---|---|---|
| Alternative A (current) | 0 | 161,942 | 68,900 | 0 |
| Alternative B | 8,121 | 220,016 | 688 | 1,409 |
| Alternative C | 8,212 | 219,955 | 658 | 1,409 |

Source: Cibola National Forest and Grasslands GIS inventory data

# Current Condition

## Developed Recreation

A developed site is characterized by a built environment containing a concentration of facilities and services to provide recreation opportunities to the public. Recreation sites are developed within different outdoor settings to facilitate desired recreational use. Developed recreation sites include facilities such as campgrounds, picnic areas, interpretive sites, visitor centers, and historic sites. Developed recreation sites provide different levels of user comfort and convenience based on the assigned ROS setting. The development scale for recreation sites range from one to five, with the lower end of the scale representing the most primitive, natural settings where site amenities are provided only if needed for the protection of resources. The upper end of the scale represents the highest level of development and facilities for the comfort and enjoyment of the visitor. Since the recreation areas are grouped by type in the tables below, the respective development scales are not reported.

The Forest Service defines the capacity of developed recreation sites in terms of "people-at-one-time" that a site can support, called PAOTs. Currently, there are 22 developed sites managed by the KRB NGs and BKMC NGs. The tables below illustrate the different types of developed facilities provided across the Grasslands and their current capacity in PAOTs.

**Table 4. Supply of developed recreation sites: Kiowa and Rita Blanca National Grasslands**

| Site Type | Number of Sites | Total Capacity (PAOT) |
|---|---|---|
| Campground | 2 | 105 |
| Picnic Site | 2 | 70 |
| Interpretive (historic) Site* | 2 | 31 |

Source: INFRA- Recreation Sites Report. INFRA is a Forest Service database that contains all developed recreation sites inventory.

*No capacity information exists for Mills Ranch Interpretive Site.

**Table 5. Supply of developed recreation sites: Black Kettle and McClellan Creek National Grasslands**

| Site Type | Number of Sites | Total Capacity (PAOT) |
|---|---|---|
| Campground (includes large group) | 9 | 625 |
| Picnic Site (includes large group) | 5 | 385 |
| Interpretive (natural) Site | 1 | 30 |
| Lookout/Cabin | 1 | 5 |

Source: INFRA- Recreation Sites Report. INFRA is a Forest Service database that contains all developed recreation sites inventory.

## Dispersed Recreation

Dispersed recreation is defined as those activities that occur outside of developed recreation sites such as boating, hunting, fishing, hiking, and biking. Thirty-two recreation sites such as trailheads, fishing sites, and designated camping sites support dispersed uses on the Grasslands.

The table below provides a summary of the access points for dispersed recreation opportunities on the BKMC NGs. KRB NGs do not have designated dispersed access points at this time.

**Table 6. Supply of dispersed access points: Black Kettle and McClellan Creek National Grasslands**

| Site Type | Number of Sites | Total Capacity (PAOT) |
|---|---|---|
| Boating Site | 5 | 330 |
| Trailhead | 2 | 65 |
| Fishing Site | 2 | 85 |
| Designated Dispersed Camping | 23 | 460 |

Source: INFRA- Recreation Sites Report. INFRA is a Forest Service database that contains all developed recreation sites inventory.

## Suitability of Recreation Activities

The ROS makes broad assumptions about what recreation activities are compatible within a given recreation setting. Based upon the ROS settings described above, the plan revision team determined suitability within the four ROS classes assigned (or proposed) for the Grasslands. Only dispersed uses would be suitable in areas classified as semiprimitive nonmotorized, all recreation uses would be suitable in areas classified as semiprimitive motorized and roaded natural. Areas on the Kiowa and Rita Blanca National Grasslands inventoried as rural would be unsuitable for recreation uses due to administrative, commercial, or industrial developments nearby. The 36 acres of NFS land classified as rural surrounding the district ranger's office on the BKNG contains trails and interpretive exhibits associated with the Battle of the Washita. Those acres would be suitable for dispersed recreation.

**Table 7. General suitability of recreation activities by ROS class**

| | Recreation Opportunity Spectrum Classification | | | |
|---|---|---|---|---|
| **Recreation Activities** | **SPNM** | **SPM** | **RN** | **R** |
| Developed | | X | X | |
| Dispersed | X | X | X | X |
| Motorized | | X | X | |

**Table 8. Kiowa National Grassland acres unsuitable for recreation development**

| Kiowa and Rita Blanca National Grasslands | (GIS) Acres | ROS Class | Recreation Suitability |
|---|---|---|---|
| U.S. Coast Guard Loran-Tac-C Station | 694 | Rural | Unsuitable |
| Clayton Livestock Research Center | 315 | Rural | Unsuitable |
| Bertrand Cemetery | 62 | Rural | Unsuitable |
| Old FS Administrative Site | 28 | Rural | Unsuitable |
| Proximity to Airport and Prison | 162 | Rural | Unsuitable |
| Proximity to Church and Railroad | 148 | Rural | Unsuitable |
| **Total Acres** | **1,409** | | |

## Summary

Each alternative and its allocation of prescription areas provide the parameters for redefining the current distribution of the Recreation Opportunity Spectrum, which has implications for activities, recreation settings, and facilities development.

The 1985 plan, alternative A, provides the baseline for evaluating needs for change. Standards and guidelines assigned roaded natural and semiprimitive motorized ROS across the Grasslands. In some areas, these prescriptions are inconsistent with providing for public safety and resource protection.

Alternatives B and C would add two more ROS classes to the Grasslands inventory: semiprimitive nonmotorized and rural. The inclusion of these classes would increase the latitude of recreation planners to more accurately characterize the recreation experience by eliminating developed and motorized uses around the Santa Fe National Historic Trail and the proposed Mills Canyon Management Area. The rural setting on the KRB NGs would identify commercial and industrial developments that may be a public safety concern for recreation.

The KRB NGs contain 230,526 acres of NFS lands. Of those, 8,121 (alternative B) acres assigned a ROS setting of semiprimitive nonmotorized would be unsuitable for developed and motorized recreation for resource protection. Alternative C would assign 8, 212 acres of semiprimitive nonmotorized.

On the KRB NGs, 1,409 acres of land have been assigned a ROS setting of rural and determined to be unsuitable for recreation uses due to industrial and commercial developments.

The BKMC NGs contain 32,735 acres of NFS lands. Of those, 36 acres would be assigned a ROS setting of rural. Those 36 acres would be unsuitable for developed and motorized recreation uses due to proximity to a Forest Service administrative site.

# Appendix I. Summary of Public Involvement

## Introduction

This document is included to show the public involvement effort for development of the "Kiowa, Rita Blanca, Black Kettle and McClellan Creek National Grasslands Land and Resources Management Plan" (herein referred to as the "plan").

## Engaging Interested Individuals and Organizations

### Public Meetings

Twenty three public meetings were held during the period 2006 through 2011, in three states, as depicted in the table below.

| Date | Event | Location |
|---|---|---|
| 09/11–19/2006 | Public Meetings | Pampa, Dalhart, and Canadian, TX<br>Cheyenne and Boise City, OK<br>Clayton and Roy, NM |
| 11/08/2007 | Harding County Commissioners Meeting | Mosquero, NM |
| 11/29/2007 | Canadian River Potential Wilderness Area Public Meeting | Roy, NM |
| 03/10–12/2009 | Focus Group Meetings | Cheyenne, OK<br>Clayton, NM |
| 04/15–18/2010 | Scoping Workshops | Cheyenne and Felt, OK<br>Roy and Clayton, NM<br>Dalhart, TX |
| 04/17/2010 | Harding County Commissioners Meeting | Mosquero, NM |
| 07/13–21/2010 | MIS Selection Discussions with Agencies | Lubbock, TX<br>Cheyenne, OK<br>Albuquerque, NM |
| 11/14–16/2011 | Availbility of Proposed Plan and Draft EIS | Cheyenne, OK<br>Clayton, NM<br>Roy, NM |

The first round of plan development public meetings was held in 2006. These were scoping meetings to gather public perception on condition and trends on the Grasslands and needs for change to the 1985 "Cibola National Forest Land and Resource Management Plan" (LRMP), which provides direction for the Grasslands. Meetings were conducted at seven locations in the vicinity of the Grasslands. Pre-meeting awareness of the events was accomplished through mailings of a plan revision informational publication to over 740 individuals and organizations who had expressed interest in participation; notification in newspapers of record; posters and flyers at selected locations; Cibola NF Web site posting; and public service radio announcements. Comments were recorded and taken under consideration in development of future sustainability and evaluation reports. Comments were also taken via a comments response form available on the Cibola NF Web site.

Two meetings occurred in November 2007. A meeting with the Harding County Commissioners, Harding County, NM, occurred on November 8th at Mosquero, NM. The purpose of the meeting

was to brief the commissioners on the draft "Kiowa National Grassland Wilderness Evaluation Report—Canadian River Potential Wilderness Area." Members from the New Mexico Wilderness Alliance and New Mexico Wildlife Federation attended. A second meeting, held at Roy, NM, on November 29, invited the public to offer input to the draft report. This meeting was promoted publically using the same media and techniques as described for the 2006 meetings.

On March 10–12, 2009, two focus group meetings were held at Cheyenne, OK, and Clayton, NM, the two ranger district offices for the Grasslands. Invitees were those individuals who had identified themselves as being keenly interested in plan revision and willing to participate in this type of intensive planning exercise. The purpose of the meetings was to receive input on desired conditions for the ecological and socioeconomic goods and services provided by the Grasslands. Participants had been given the opportunity beforehand to study the comprehensive evaluation report and the draft desired conditions and were, thus, informed to contribute to the further crafting of desired conditions. Notes were taken, evaluated for compliance with law, regulation, and policy, and incorporated as appropriate into the draft plan.

During April 15–18, 2010, following the notice of intent to conduct an EIS study, five scoping meetings were held in different locations in the vicinity of the Grasslands. This meeting was promoted publically using the same media and techniques as described for the 2006 and 2007 meetings. Attendees had been given access, either by hard copy, CD, or Web site, of the working draft Grasslands plan prior to the meetings. The purpose of the meetings was to ascertain if other alternatives to achieving the desired conditions existed; if guidelines and standards were sufficient; and how monitoring elements could be crafted to determine progress on objectives. Scoping comments received were compiled, evaluated for compliance with law, regulation, and policy, and were incorporated where relevant to the plan development process. Planning staff also appeared before a planned monthly meeting of the Harding County Commissioners, Harding County, NM, to update the commissioners and attending public on the working draft Grasslands plan and to seek further input and comments.

During the period July 13–21, 2010, three open, interagency meetings with state and Federal wildlife agencies were conducted by the Cibola wildlife planner and Cibola forest biologist. The purpose of these meetings was to receive input from state and Federal biologists on the identification and selection of management indicator species and ecological indicators for the purpose of evaluating alternatives in the environmental impact statement and future monitoring of important wildlife species. Input was recorded and selections of species were made based on input received.

On November 14–16, 2011, we held three public meetings—one each in the towns of Cheyenne, OK; and Clayton and Roy New Mexico—to stimulate interest and involve the public in the recently released proposed LRMP and draft EIS. The comment period opened on September 30, 2011, and closed December 28, 2011. Comments received as a result of the public meetings described above are available for review in the planning record file located at the Cibola NF Supervisor's Office in Albuquerque, NM.

## Other Media Used in Public Involvement

Plan development updates were periodically mailed out to individuals and organizations listed and maintained in the Cibola plan revision ACCESS database. Dates of these revision update

mailings were as follows: April 2006, December 2006, April 2007, July 2007, October 2007, February 2008, October 2008, and April 2009.

A "Public Participation Plan for the National Grasslands Plan Revision Process" was posted to the Cibola NF Web site in January 2008. It was replaced with a "Citizens Guide to Participating in the Plan Revision Process" in April 2009. Both documents were intended to serve as guidance for individuals interested in participating in developing the draft Grasslands plan.

Other plan development documents throughout the process were made available on the Cibola NF Web site, including the sustainability and evaluation reports, the potential wilderness evaluation document, the working draft plan, an analysis of the management situation supplemental document, and Federal Register notices. Posting of these and other documents to the Web site began in 2006. A comment form available on the planning Web page has allowed visitors to comment on any document or planning issue at any time.

## Sustainability and Evaluation Reports

Under the 2008 Planning Rule, three reports were prepared and released to the public September 19, 2008: "The Grasslands Socioeconomic Sustainability Report," "The Grasslands Ecological Sustainability Report," and "The Grasslands Comprehensive Evaluation Report." These reports were made available in hard copy, by CD, and on the Cibola NF Web site. A notice of initiation published in the Federal Register announced the availability of these reports. Notification of availability of these reports was made using the same media and techniques as described for the 2006, 2007, and 2010 public meetings. Comments received on the reports are available for review in the planning record file located at the Cibola NF Supervisor's Office in Albuquerque, NM.

## Interruptions of the Grasslands Planning Process

When plan development for the Grasslands started in 2006, the Cibola planning team followed direction under the 2005 Planning Rule, which had been finalized by USDA FS and published in the Federal Register on December 22, 2004. On March 30, 2007, the U.S. District Court for the Northern District of California issued an injunction that ordered the Forest Service to discontinue use of the 2005 Planning Rule. The Cibola NF and NGs complied with the court order, and further planning activities undertaken were in compliance with laws and rulings not affected by the injunction. Much of the information and public comments gathered prior to the injunction was still useful. Work continued on an integrated need for change report, until finalization of the 2008 Planning Rule on April 21, 2008. At that time, plan development began following guidance from the 2008 Rule.

On June 30, 2009, the 2008 Planning Rule was enjoined by the U.S. District Court for the Northern District of California, and development of the Grasslands plan was again temporarily suspended. The U.S. Department of Agriculture subsequently determined on December 18, 2009, that plans could be amended, revised, or developed using the 2000 Planning Rule as amended, which followed the 1982 Rule Provisions. The Grasslands planning effort moved forward using the 1982 Rule Provisions. A "Supplement to the Comprehensive Evaluation Report" that was published in 2008 under the 2008 Planning Rule was published in January 2010 to meet analysis of the management situation requirements of the 1982 Rule Provisions.

## Tribal Government Consultation

Seven federally recognized tribes have ties to the Grasslands. They are the Mescalero Apache Tribe, Jicarilla Apache Nation, Cheyenne and Arapaho Tribes, Apache Tribe of Oklahoma, Comanche Nation, Kiowa Tribe, and Wichita and Affiliated Tribes.

The Cibola NF first notified the above tribes of Grasslands plan development in the annual letters and list of projects sent out February 27, 2006, and initiated face-to-face meetings later that year. We have continued that process annually, with the status of plan development updated every year. Tribal members have also occasionally participated in public meetings.

## Local, State, and Federal Government Agency Coordination and Assistance

The following governments and agencies participated or assisted in development of the draft plan since the initiation of plan development. No Federal agency requested cooperating agency status during the EIS development.

- U.S. Fish and Wildlife Service, Tulsa, Austin, and Albuquerque Field Offices
- U.S. Bureau of Land Management, Tulsa and Santa Fe State Offices
- U.S. Department of Agriculture Natural Resources Conservation Service
- Playa Lakes Joint Venture
- Texas Department of Parks and Wildlife
- Oklahoma Department of Wildlife Conservation
- New Mexico Department of Game and Fish
- Harding County, Union, Mora, Colfax Counties, NM
- Dallam, Hemphill, and Gray Counties, TX
- Cimarron and Roger Mills Counties, OK
- Canadian River Riparian River Restoration Project – Participating Soil and Water Conservation Districts

## Official Public Notification

### Federal Register and Newspaper of Record Notifications

| Required Notices | Federal Register Publication Date |
|---|---|
| Notice of initiation of plan development | September 19, 2008 |
| Notice of intent to prepare an EIS in conjunction with development of a new land and resource management plan. | January 15, 2010 |

### Newspapers of Record for the Grasslands

- Union County Leader, Clayton, NM
- Boise City News, Boise City, OK
- The Dalhart Texan, Dalhart, TX

- Cheyenne Star, Cheyenne, OK
- The Canadian Record, Canadian, TX
- The Pampa News, Pampa, TX

# Appendix J. Data and Analysis Methods

This appendix presents a technical discussion of the analyses processes and models used during the plan development effort for the Kiowa, Rita Blanca, Black Kettle, and McClellan Creek National Grasslands (herein collectively referred to as the "Grasslands"). This appendix focuses on the quantitative methods used to perform the analyses and documents how the analyses were done and supplements the broader and less technical descriptions included in the body of the programmatic final environmental impact statement (FPEIS). The discussion includes basic assumptions, modeling components and inputs, methods, and constraints. Additional information and documents used in the analyses processes are contained in the specialist reports for the respective resource topic areas, and are incorporated here by reference.

## Assumptions Common to All Analyses

- The land management plan provides a programmatic framework for future site-specific actions.
- Land management plans do not have direct effects. They do not authorize or mandate any site-specific projects or activities (including ground-disturbing actions).
- Land management plans may have implications or environmental consequences of managing the Grasslands under a programmatic framework.
- The plan decisions (desired conditions, objectives, standards, guidelines, management areas, monitoring) will be followed when planning or implementing site-specific projects and activities.
- Law, policy, and regulations will be followed when planning or implementing site-specific projects or activities.
- Monitoring will occur and the land management plan will be amended as needed.
- We will be funded similar to past budget levels (past 5 years).
- The planning timeframe is 15 years; other timeframes may be analyzed depending on the resource (usually a discussion of anticipated trends into the future).

### Analysis and Evaluation Matrix

During the analyses processes for the draft EIS (DEIS), specialists used an evaluation matrix to determine what was important to analyze in terms of differences between alternatives as related to the consequences to a particular resource. All matrices filled out by specialists in particular resources areas were available to all other specialists, who could then cross-reference for interrelated/interdisciplinary effects identified by specialists in other disciplines. The template for this matrix can be found at the end of this appendix.

## Demographic and Economic Analyses

### Social Impact Analysis

Defining the relationship between management of the Grasslands and the economic and social environments is twofold. First, individuals with different demographic and social backgrounds are likely to be affected differently by management decisions. Second, social and economic well-being may affect their preference for recreational opportunities. An important component of this analysis is to inform decision makers and the public of the social and economic conditions in the study area. Those conditions may affect the frequency and type of activities residents participate

in, which in turn affect individual livelihoods. Recreational, subsistence, and cultural activities taking place on the Grasslands play an important role in defining the social and economic dynamic of the study area. Visitors generate important economic stimulus for many businesses, which impact employment and income levels.

Social impact analysis identifies population and demographic trends in the study area. Current population levels influence the use of natural resources; and forecasts of future population levels can indicate whether there may be the potential for increased pressures on Grassland resources. Age distributions provide insight into the proportion of individuals in the working age cohorts versus retirees and minors who typically have different use patterns and use services in different ways. Similarly, the racial composition of the population may affect cultural and heritage uses. Employment and income statistics describe the economic conditions of the study area, as well as aid in the identification of important sectors of the economy. Additionally household income could affect participation levels in outdoor recreation; the greater the income of local residents, the greater is their ability to participate in various recreational activities.

Population is an important consideration in managing forest and grassland resources. In particular, population structure (size, composition, density, etc.) and population dynamics (how the structure changes over time) are essential to describing the effects and consequences of forest management and planning on a social environment. Population increases may lead to conflicts over land use, travel management, recreation activities, and values. These are conflicts that Forest Service managers may have to contend with and attempt to balance when making management decisions.

## Economic Impact Analysis

Analyses for economic impacts of plan alternatives—specifically for recreation, energy development, special uses, and livestock capability—were completed for the land and resource management plan (LRMP) revision. Computer generated models were used to analyze the economic impacts of major land management activities of the USFS upon the local communities and analyze the effects of alternatives upon the business areas named above.

Principles of economic impact analysis are relied upon to estimate the effects of the Grasslands revised plan on the economic environment of the study area. “Economic impact analyses seek to determine short-term effects that Forest Service programs have on economic conditions in defined impact areas in which the planning area occurs” (Forest Service Manual (FSM) 1900). Economic impact analyses investigate the effects of the alternative development scenarios on employment and income. The relative size of the local communities plays an important role in the assessment of job and income impacts to the economy. Broader, more diverse, economies should be more resilient to changes in jobs and income than smaller, more rural, communities. For example, a loss of 10 jobs in a large metropolitan area should have very little impact on the overall health of the economy. However, the same loss in jobs in a small, rural community may severely affect local economic conditions. Thus, when assessing the magnitude of impacts to employment and income across alternatives, it is important to keep in mind the relative importance of those economic factors to the specified study area.

To estimate the economic impacts to the Grasslands study area economy, one model covering eight counties was developed. The counties included Mora, Harding, and Union Counties, New Mexico; Dallam, Hemphill, and Gray Counties, Texas; and Cimarron and Roger Mills Counties,

Oklahoma. Colfax County, NM, was not included because of the extremely small Federal ownership in that county, in conjunction with the large economic impact that county has in comparison to others in the Grasslands vicinity. The Grasslands study area matches both state and local recognition of a functional social and economic planning area. Labor flows between towns and counties are generally contained within these eight counties.

Models of the local economy were built using IMPLAN[1] Professional 3.0 software and 2008 data. For the purposes of this report, the local economy is defined the same as the study area. Changes in activity on the Grasslands may have several different consequences for the condition of the economic environment. Ultimately, a change in the activities would change the local economic stimulus. A change in economic stimulus to a region (e.g., increased recreational visits) would likely change the total level of jobs and income. Economic impact analyses are reserved for situations where a change is being made to the existing condition as is the case of the action alternatives. In the case of the no action alternative there would be no change to the existing Forest/Grasslands plan. Existing data for activities taking place under the current plan is used to estimate what the current economic contribution is to the local economy. Such a contribution analysis allows for the conditions under alternative A to be analyzed in detail and provides a better basis for comparison when analyzing the effects from the action alternatives.

To conduct both the economic impact and contribution analyses, IMPLAN models are imported into the Forest Economic Analysis Spreadsheet Tool (FEAST).[2] IMPLAN and FEAST software account for the production cycles and inter-industry purchasing habits of local firms and can, thus, parcel out the levels of employment and income supported by activities on the Grasslands. This allows for an assessment of the overall importance of these lands to the local economy in terms of jobs and income supported.

## Financial Efficiency Analysis

Economic efficiency analysis was conducted using QuickSilver Version 6. Data on program revenues were collected from the Final National Forest Statement of Receipts (ASR-13-1). Data on program costs were provided by the Cibola NF budget staff (1982 Rule, 219.12(e)). QuickSilver is a Forest Service program for economic analysis of long-term, on-the-ground resource management projects. It provides a consistent benefit/cost, efficiency analysis framework to determine if one management action costs less or has a better payoff than others (present net value).

Calculating present net value (PNV) is required as part of the planning process. However, the data required for a detailed financial efficiency analysis is unavailable. In order for the Grasslands to meet adaptive management objectives, the new plan will not prescribe specific management activities. This allows the flexibility to manage resources under ever-changing environmental

[1] Data reported by the Minnesota IMPLAN Group (MIG) is used to assess the relative size of sectors in a local economy. MIG reports annual data for all counties in the United States. IMPLAN employment data is reported by economic sectors grouped together according to similarities in the goods and services offered. IMPLAN data used for this analysis is for the year 2008. IMPLAN stands for “Impact Analysis for Planning.”

[2] FEAST is a Microsoft Excel-based workbook designed to describe impacts to employment and income by resource program and major industry. To conduct the economic impact and economic efficiency analyses, IMPLAN models are imported into FEAST. This provides an assessment of the overall importance of these lands to the local economy in terms of jobs and income supported.

conditions. A more detailed financial efficiency and economic impact analysis should be conducted during the NEPA stage for proposals of future management activities.

The current resource programs managed by the Grasslands generate revenue from sale of products, permits for various activities, and leases for minerals. The programs generating revenue are recreation, range, minerals, and nonrecreation special uses. Grasslands personnel provided current data on revenue streams. Under the no action alternative it is assumed there would be no impact to these revenue streams, and they would continue throughout the next planning cycle. Since these plans are expected to be updated every 10 to 15 years, a 15-year planning cycle is used for the financial efficiency analysis.

The recreation, range, minerals, and nonrecreation special uses programs are funded under the general budget and externally funded activities such as volunteer and service agreements and in-kind sharing. There is much uncertainty about future budgets and no reliable data on future program costs. A 3-year average for each resource program's budget was used as an estimate of annual costs. Also, a variety of ecosystems services projects are part of the management strategy for Grasslands resources. There is limited data regarding the costs for these types of projects, which include prescribed burning, thinning, and weeds treatments. The financial efficiency analysis is limited to only the revenues received from management activities and the costs of annually funded ecosystems services projects. The costs included in this analysis are just a portion of the total operating budget. This greatly limits the informational capacity of this analysis; however, it provides some basis of comparison for future revenue streams back to the Grasslands. PNV is defined as the discounted sum of benefits minus the discounted sum of costs; however, since not all costs are actually accounted for, this analysis should primarily be used to evaluate benefits. A federally prescribed discount rate of 4 percent is used in this analysis (FSM 1900). Inflation is also a variable that can affect the PNVs associated with each alternative. However, due to the uncertainty of future inflation, OMB Circular A-94 recommends the avoidance of making assumptions about the inflation rate whenever possible. Thus, for the purposes of this project, inflation was left at zero.

The PNV if Grasslands management were to continue under alternative A is $152,409,164. In this analysis, costs are limited to only those for specific program areas and ecosystem services projects occurring on the Grasslands. Therefore, this value provides a better relative measure of the discounted net revenue the Grasslands are expected to generate during the next planning cycle in 2010 dollars. As mentioned above, these programs are funded with a combination of the general budget and external funding. Currently there is no information available regarding the level and distribution of these funds in future years.

The PNV for alternative B was calculated using the same methods as described under alternative A. There is no data for future revenues generated by resource program. However, this alternative does not prescribe any activities that would cause a change to those revenue streams. Any change in program revenues would occur as a result of supply and demand conditions, and tastes and preferences of stakeholders in the study area. This would occur regardless of the chosen alternative. Therefore, the same revenue streams used for alternative A are assumed to carry though under B and C. Alternative B places a greater emphasis on vegetation management, which will increase restoration costs. This is reflected in a slightly lower PNV than alternative A. The PNV for this alternative is $151,130,674. Although this PNV is lower than A, it does not account for nonfinancial benefits associated with the improved vegetative conditions.

Alternative C is not expected to result in a change in revenues back to the Grasslands. Therefore, the same program revenues used for alternatives A and B are also used for this alternative. Likewise, the expected costs of implementing this alternative are assumed to be the same as alternative B. Therefore, the PNV for alternative C is the same as alternative B, $151,130,674. This financial efficiency analysis is limited due to the lack of data availability and site specific prescriptions in the alternatives. In the case of programmatic NEPA documents similar to this one, PNV does not provide a reliable indicator to base management decisions upon. The PNVs reported in this document are a measure of discounted revenues with limited information on costs.

### Incomplete and Insufficient Information

For some resource areas it is difficult to predict how activity levels would change under the action alternatives, and there is no data available to estimate the resulting effects. One such case is recreation. Insufficient information exists to accurately estimate changes in recreation use that would occur under implementation of the action alternatives analyzed in this report. Although certain trends in visitor use may be predicted from the guidelines set forth under each alternative, there is no methods and/or data available to estimate actual changes in visitation. Similar circumstances occur with grazing. Although allowable grazing can be addressed in the plan, uncontrollable factors may influence the actual grazing that may take place during future years. Existing data used for the analysis of the no action alternative may not represent healthy grazing activity under other ecosystem conditions. For example, rain plays an important role in permitted grazing from year to year. In drought years there is less grass that may be consumed by livestock, and consequently stocking levels may be decreased. Such uncertainty is difficult to control for at the planning stage. The effects analysis for action alternatives is limited by the lack of data for these types of circumstances. Therefore, sensitivity analysis and qualitative analysis of potential economic effects are relied upon when analyzing action alternatives. Sensitivity analysis involves reporting the effects for a range of potential outcomes. High and low end values are reported, and the true effects are assumed to fall within that range.

## Livestock Use

Livestock grazing is the most predominant use of the Grasslands. The spatial analysis for lands available for livestock use was based on the area within the proclaimed boundary of the Black Kettle (BK), McClellan Creek (MC), and Kiowa and Rita Blanca (KRB) National Grasslands (NGs) and from records of active and vacant grazing allotments. The timeframe used is the past decade (2000 to 2009) through the planning period. Existing conditions and environmental consequences were evaluated using field reconnaissance, visual obstruction readings, Parker 3 Step transects, cover-frequency transects, production clippings, photo points, and composition inventories. Data collected has been compared with historical data and with the TEU inventory.

Suitability and capability of National Forest System (NFS) land were determined in the 1985 Cibola NF LRMP. Suitability is determined based on compatibility with desired conditions and objectives for the vegetation types within the plan area, including wildlife habitat needs. Suitability and capability of the Grasslands to accommodate livestock use have not displayed an appreciable change since 1985. Benchmarks (minimum and maximum sideboards used in assessing grazing capacity for the Grasslands) that were established during the 1985 plan development were found to be still valid and appropriate for use in evaluation of the plan alternatives in 2011.

The plan components (i.e., objectives, guidelines, standards, suitability, and monitoring elements) and management approaches of each alternative were evaluated against the affected environment for livestock use by interdisciplinary team members to determine if livestock use was affected positively, negatively, or not at all.

An assumption important to the analysis on livestock use comes from the Forest Service's 2008 "Comprehensive Evaluation Report." That report concludes that there is no indication that there will be a major increase or decrease in grazing on the Grasslands over the next 20 years; however, cattle numbers and management strategies are expected to continue to fluctuate in response to drought, wildfire, prescribed fire, and other factors that change range conditions, such as expansion or decline of prairie dog colonies.

## Invasive Species

A noxious/invasive species inventory was conducted on the Grasslands as part of a forestwide inventory in 2006. The BK NG was found to have 6,000 acres with scattered populations of various noxious/invasive species. The KRB NG had 1,597 acres with scattered infestations of species classified as noxious/invasive. The BK NG has been treating about 700 acres a year since April 2008. Primary species that have been treated are scotch thistle and eastern redcedar. Treatments began on the KRB in 2009. Primary species to be treated are saltcedar, Canada thistle, and Scotch thistle. Treatment will follow an integrated pest management approach that will utilize treatment methods such as prescribed burning, mechanical, manual, cultural, and herbicides.

## Special Forest Products

The plan components (i.e., objectives, suitability, guidelines, standards, and monitoring elements) and management approaches of other resource areas were evaluated against producing the goods and services of special forest products to determine if the special forest products resource was affected positively, negatively, or not at all.

Conversations were had at various times between the timber management officer, the BK district staff, and Supervisor's Office personnel discussing the existing condition where black locust and eastern redcedar are encroaching on the Grassland areas. The TMO and East Zone silviculturist have made several site visits to Mills Canyon over the past 2.5 years to assess the existing condition, especially in pinyon-juniper areas located on the rim of the canyon.

## Recreation

An interdisciplinary approach was used to evaluate possible environmental consequences and outcomes of plan alternatives on developed, dispersed, and motorized recreation. We developed individual matrices that prompted review of the plan components for each resource area by alternative. This examination revealed whether implementation of any given alternative might have important positive or negative consequences and outcome to the recreation resource.

Data from the National Visitor Use Monitoring Project (NVUM) for the Cibola NF and National Grasslands was used to estimate recreational use on the forest. Most activities are engaged in for far less than 12 hours at a time, so one recreation visitor day (RVD) often includes many occasions of an activity. This differs from the NVUM measure of recreation visits, which has no time element. A recreation visit can range from a few minutes to several days.

To estimate the economic impact of recreation, it was necessary to first separate local resident visits from other state residents and nonresident (out-of-state) visits. For purposes of this analysis, state residents from outside the 9-county area and out-of-state residents were considered as nonlocals. This distinction was necessary since economic impacts are based on new dollars flowing into the economy. Resident recreation expenditures, on the other hand, represent a part of the current distribution of existing dollars already in the regional economy

Each national forest is classified as a high, average, or low spending area by comparing local spending with national averages. Spending profiles from NVUM were based on “trip segments” rather than activities.

## Nature-Based Tourism and Special Areas

An interdisciplinary approach was used to evaluate possible environmental consequences and outcomes of plan alternatives on special areas and natural tourism. We developed individual matrices that prompted review of the plan components for each resource area by alternative. This examination revealed whether implementation of any given alternative might have important positive or negative consequences and outcome on the resource under consideration.

As part of the planning process, two of the special areas evaluated have been the subject of repeated studies by the Forest Service: the Canadian River and research natural areas. A summary of those studies follows.

### Canadian River, Eligible Scenic River

The Canadian River, eligible scenic river, and potential research natural area have been the subject of both qualitative and quantitative analysis by the Forest Service as required by the Wild and Scenic Rivers Act, Section 5(d), 1968 and the 1982 Planning Rule Provisions Section 219.25, respectively.

Wild and scenic rivers are segments of watercourses that contain a mixture of natural, cultural, scenic, and recreational values that are outstanding for their particular geographic area. The Canadian River was inventoried in 1982 in a nationwide rivers inventory by the National Park Service. From 1998 to 2002, the Cibola plan revision team completed the classification and eligibility process for potential rivers as defined by FSH 1909.12, Chapter 80. Two candidate streams were evaluated on the KRB NGs. Of those, only the Canadian River met two or more of the eligibility criteria. The analysis determined that the river is free flowing and has the following outstanding and remarkable values: scenery, recreation, geology, and history. The final classification was “scenic,” but eliminated as “wild” due to road access. No suitability evaluation was done for the river segment, and it has not been recommended for designation. (A suitability study provides the basis for determining which rivers to recommend to Congress as additions to the National Wild and Scenic Rivers System. There are two potential outcomes of a suitability evaluation: either the river segment is recommended for congressional designation or not. If not, its status as an eligible river is removed and no longer falls under wild and scenic river protections. However, the segment may be administratively designated as a special area to ensure preservation of the outstandingly remarkable values such as scenery, recreation, history, and geology. If the segment were recommended for congressional designation, the protections currently in place would remain in effect.) As of this writing, this segment of the Canadian River

remains eligible for future designation, and protections conveyed by amendment 10 of the 1985 land management plan remain in effect.

A recent (10/2010) GIS recalculation of length resulted in a total of approximately 20 miles. Seventeen miles of eligible scenic river are on Forest Service lands and 3 miles are located on other jurisdiction lands.

In 1997 and 1998, forest personnel visited and evaluated six candidate streams on the BK and MC (BKMC) NGs. None of those candidate streams met two or more of the wild and scenic eligibility criteria and were eliminated from further consideration.

## Research Natural Areas

The 1985 plan provides direction to study for possible designation of a 300-acre research natural area (RNA) on each of three national grasslands: Black Kettle, Kiowa, and Rita Blanca. The Southwestern Region's 1984 RNA progress report indicated that shortgrass prairie representation in the national RNA system was needed because of the importance and geographic distribution of the ecosystem. Under a cost-share program agreement in 1987, The Nature Conservancy evaluated the KRB NGs for potential shortgrass prairie sites as called for in the plan. Preliminary screening and two multiday field trips were undertaken to gain understanding of range conditions and identify the most promising sites. A final report was prepared by The Nature Conservancy (TNC) that describes field methods and findings of the research.

The TNC report identified and described four primary sites with RNA potential for the KRB NGs. The Southwestern Region RNA taskforce visited those sites again in 1988 to evaluate the areas for possible designation. In July 1988, the taskforce formally recommended that the region proceed with designation for Unit 46 and portions of Unit 3 on the Kiowa NG. Unit 46 was considered to be an excellent example of blue grama-buffalo grass ecosystem, and Unit 3 presented an excellent example of sand sagebrush-blue grama ecosystem. Of principle interest was a large area of sandhills prairie in good condition.

In 1991, an establishment record was prepared by The Nature Conservancy for Unit 46; Kiowa Shortgrass Research Natural Area, but was not recommended by the forest supervisor or regional forester due to conflicts between restrictive RNA management guidelines and the long-term fire effects research being conducted by Rocky Mountain Research Station at the site. FSM 4000, Chapter 4063, "Research Natural Areas" states that research natural areas are primarily for nonmanipulative research, observation, and study. However, the Federal Committee on Ecological Reserves has said that deliberate manipulation may be utilized to maintain the unique feature that the RNA was established to protect. As a result, there is ongoing discussion (disagreement) whether the prescriptive fire use in the research study is considered manipulative research and, thus, invalidates establishment of the shortgrass RNA in the future. Other scientific disagreement is centered upon cattle grazing within the area. Some researchers believe livestock grazing mimics historical use by large ungulate populations (bison), and others consider livestock grazing to be human manipulation of the ecosystem that invalidates establishment of a shortgrass RNA in Unit 46.

As part of the current planning process, in 2009, RNA needs were ranked according to the distribution of currently protected lands across potential natural vegetation type (PNVT) classes, ecoregions and sections, and terrestrial ecosystem unit inventory (TEUI) climate gradients. This

evaluation was conducted by the respective district rangers, district resource specialists, and forest planners using the regional "Research Natural Area Process for Forest Plan Revision" under the 1982 Planning Rule Provisions and Southwestern Region terrestrial ecosystem unit inventory data. Shortgrass prairie was reevaluated and failed to meet eligibility criteria due to ongoing research, human disturbances, and modifications such as fences, plowing, water developments, roads, and utility corridors. Shinnery oak and mixed-grass prairie on the BKMC NGs were evaluated but failed to meet eligibility criteria because the areas were small and fragmented, or exhibited various degrees of human disturbance from plowing, grazing, invasive species, and herbicide use. The evaluation table (RNA Evaluation: Review of Representative Ecological Conditions) can be found in appendix D.

On May 18 and 19, 2010, as a result of scoping comments received, three areas identified in the TNC report were reevaluated by KRB district staff using cover frequency transects and ocular observation to document current conditions. These were Kiowa Units 100 and 3, and Rita Blanca Unit 19. Kiowa Unit 46 was not reevaluated.

On Unit 100, the evaluation revealed that canopy cover had shifted since 1987 and visually galleta is the most dominant species, although the frequency transect shows that galleta and blue grama are equal in canopy cover at 32 percent each. Bare ground in 1987 was less than 10 percent, but in 2010 bare ground is 20 percent. Based upon structural improvements and shift in plant composition, the staff determined this unit is not a good candidate for shortgrass RNA designation.

In 1987, Unit 3 was proposed as a good candidate as RNA for sand sagebrush-blue grama ecosystem. At that time, the sand sagebrush cover was reported as 10 to 20 percent. In May 2010, district staff measured canopy cover both inside and outside a small exclosure within the unit. Line intercept transects showed that shrub canopy within the exclosure was 50 percent and 33 percent outside the exclosure. This is much higher than is considered a climax community for sand sagebrush. The staff determined that Unit 3 is not suitable for RNA designation for a number of reasons: existing infrastructure, an old field, current cultivation (corn) surrounding the area, and the shift in canopy cover.

In 1987, Unit 19 of the High Lonesome was considered a good candidate as RNA for shortgrass ecosystem. No transects were read for this evaluation, but observation indicates that there is a much higher incidence of three-awn and forbs than were present in 1987. Broom snakeweed, which was rare in 1987, is common in 2010. Staff determined that this area is not suitable for RNA designation because of past human disturbance, historical grazing pressure, and the shift in canopy composition.

## Scenery

The scenery management system process defined in "Landscape Aesthetics: A Handbook for Scenery Management" was used to develop scenic integrity objectives for this draft plan.

Valued landscape character descriptions were developed and incorporated into the desired condition for scenic resources. Developed recreation sites, roads, trails, and other special areas were analyzed to establish concern levels. Special areas were also assigned concern level 1, including national and state designated scenic byway corridors, important birding areas, and the Santa Fe National Historic Trail corridor. Since the Canadian River through Mills Canyon has

been determined to be eligible for designation as a scenic river under the Wild and Scenic Rivers legislation, the Grasslands portion of the canyon was classified as a high scenic integrity objective area. Concern levels determine the relative importance of scenic quality to people who visit the Grasslands.

There was a variation from the GIS mapping process described in the SMS manual. Due to the relatively flat nature of the topography covered with low growing vegetation (grasses, shrubs and forbs), the landscape is generally visible with few variations that would obstruct views. Also taken into account are the fragmented ownership patterns. Generally an entire Grassland unit was assigned a scenic integrity objective (SIO) rather than dividing based on the distance from concern level 1 roads or areas. This was in lieu of the more common approach of a GIS analysis to determine landscape visibility that would have further fragmented the management of these often discreet units. However, distance was a factor when determining SIO classes. For example if a unit was generally within the ½ mile foreground of a concern level 1 route or area, the entire unit would be selected for high scenic integrity.

## Wilderness

As part of the LRMP revision process for the KRB and BK and MC (BKMC) NGs (herein collectively referred to as the "Grasslands"), the Forest Service prepared the "Kiowa National Grassland Wilderness Evaluation Report" (see the Web address provided in appendix B). The Forest Service must evaluate all roadless areas and consider lands possessing wilderness characteristics for potential wilderness designation during plan revision (1982 Rule Provision Sections 219.17 and 219.18).[3] If the area is eventually recommended for wilderness designation, then the revised plan will contain goals and objectives that will protect its wilderness characteristics.

This (2008) evaluation began with an inventory of areas of Federal land over 5,000 contiguous acres, or areas that meet the criteria as described in Forest Service Handbook 1909.12, Chapter 71.[4] After the potential wilderness was identified, it was evaluated for capability, availability, and need as described below.

### Capability

Wilderness capability describes the basic characteristics that make the area appropriate and valuable for wilderness designation, regardless of the area's availability or need. Five sets of factors are used to determine capability: naturalness, level of development, opportunities for solitude, special features, and the ability of the Forest Service to manage the area as wilderness (manageability). The first four of these factors consider how the current conditions of the potential wilderness area (PWA) fit the definition of wilderness. Manageability is slightly different because it evaluates features of the area that would make it more or less difficult to manage the area as wilderness, such as size, shape, and juxtaposition to external influences. The Canadian River Potential Wilderness Area was rated as medium for wilderness capability.

[3] The transistion provisions, 36 CFR 219.17(b)(3), of the 2012 Planning Rule (Vol. 77, No.68, April 9, 2012) allow use of the provisions of the 1982 National Forest System Land and Resource Management Planning Rule to amend or revise plans.

[4] Areas smaller than 5,000 acreas may also be considered if they are adjacent to an existing wilderness or east of the 100th meridian. Black Kettle National Grassland is east of the 100th meridian.

### Availability

Availability criteria indicate the availability of a potential wilderness area for wilderness designation by describing other resource and land use potentials for the area. Availability examines the potential impact of designating an area as a wilderness to both the current and future land uses and activities. In essence, it is a summary of the tradeoffs between wilderness and other uses. The Canadian River Potential Wilderness Area was rated medium for availability.

### Need

These evaluation criteria indicate how the potential wilderness area might fit into the National Wilderness Preservation System (NWPS); in this case we evaluated comparable lands within a 250-mile radius of the PWA, which is assumed to be about 1 days' drive. Need is considered at the regional level and must incorporate public participation. The criteria used to evaluate need include consideration of other wilderness and nonwilderness areas that provide opportunities for unconfined outdoor recreation or preservation of certain ecosystems characteristics. The evaluation of need showed that the Canadian River Potential Wilderness Area generates a low degree of need as a new wilderness area.

The findings of the wilderness capability, availability, and need evaluations based upon the best available data were used to determine whether or not to make a preliminary administrative recommendation for wilderness designation of the Canadian River PWA. The deciding official's (regional forester) recommendation will be documented in the final plan and the plan approval document. If the PWA is recommended for wilderness, the recommendation will receive further review by the Chief of the Forest Service and the Secretary of Agriculture. If the Chief of the Forest Service intends to move forward with a wilderness recommendation, the Forest Service will complete a detailed analysis of the tradeoffs and impacts in accordance with the National Environmental Policy Act, including additional public review and comment. Only Congress has the authority to make final decisions on wilderness designation.

## Roads and Access

As defined in 36 CFR 212.5(b)(1), each national forest must identify the minimum road system needed for safe and efficient travel and for administration, utilization, and protection of National Forest System lands. The minimum system is the road system determined to be needed to meet resource and other management objectives adopted in the relevant land and resource management plan (1982 Rule Provisions Section 219), to meet applicable statutory and regulatory requirements, to reflect long-term funding expectations, and to ensure that the identified system minimizes adverse environmental impacts associated with road construction, reconstruction, decommissioning, and maintenance. Thirty-six CFR 212.5(b)(2) states that roads no longer needed to meet forest resource management objectives must be identified and, therefore, should be considered for decommissioning or for other uses, such as trails. A travel analysis process (TAP) was conducted for the KRB NGs concurrent with the plan revision to identify the minimum road system. The TAP is intended to be a broad scale comprehensive look at the transportation network across the KRB NGs. It is important to note that the TAP does not make any decisions related to roads or motorized trail systems, but it will be used to inform management decisions for individual roads or motorized trails. Travel analysis for BK and McClellan Creek National Grasslands was done in 1989; which closed the district to motor vehicle entry except for roads signed open (amendment 4, May 29, 1990). For purposes of this

report, NFS road mileage on the Grasslands was obtained from the forest infrastructure database (INFRA).

## Soils and Watersheds

The spatial analysis was based on the Forest Service lands within the proclaimed boundary of the Grasslands. Existing conditions and environmental consequences were evaluated using existing forest data, satellite imagery, and data from other sources as cited. Numerous onsite soil condition assessments were made and existing field notes were analyzed to classify and extrapolate soil condition across the Grasslands as part of the TEUI. Overall accuracy of mapping and information provided by the TEUI and soil condition protocol is considered reliable at the ecological unit or landscape level.

Each alternative was evaluated for consequences on water and soil resources.

## Air

The regional emissions data were obtained from the EPA's AirData Web site for the year 2002 and from the National Emissions Inventory (NEI) for the year 2008. Based on emissions data from 2002 to 2008, the overall trend was a decrease in all criteria air pollutants measured (excludes ozone and includes volatile organic compounds) in the four counties covering the Kiowa NG. The projected trend out to 2018, using the Forest Service's Emissions Tool11, indicates a continued decrease in criteria pollutant emissions except for particulate matter $PM_{10}$ and $PM_{2.5}$. It is not clear at this time why there are slight increases for particulate matter, but these increases are slight and do not exceed National Ambient Air Quality Standards (NAAQS) or State standards. To date there have been no documented exceedances of the NAAQS due to Grasslands activities. This trend is expected to continue over the next 5 to 10 years.

Based on emissions data from 2002 to 2008 from the EPA AirData tool and the NEI, the overall trend was a decrease in all criteria pollutants except a small increase in sulfur dioxide emissions and large increase in volatile organic compounds (VOCs), in the five counties covering the BKMC and RB NGs. From 2002 to 2008, the VOCs doubled due to large increases in emissions in Hemphill County in Texas and Roger Mills County in Oklahoma, both of which comprise the BK NG. The increase in emissions in 2008 can be attributed to petroleum and related industries. Although VOCs are not currently regulated by the EPA, they do react with nitrogen oxides to form ozone, which is an EPA regulated criteria pollutant. Even with the doubling of VOC emissions in Hemphill County, it is still in attainment for ozone.

In general, the projected trend out to 2018 using the Forest Service's Emissions Tool11 shows decreases in the criteria pollutant emissions. Increases in nitrogen oxides in Roger Mills County, Oklahoma, and carbon monoxide and sulfur dioxide in Gray County, Texas, are predicted. There are also projected increases in ammonia and VOCs, which may be due to further increases in oil and gas development or higher levels of urbanization in these counties. There have been no documented violations of the NAAQS in the counties the BKMC or RB NGs cover due to Grassland activities. This trend is expected to continue over the next 5 to 10 years.

Emissions from activities on and off the Grasslands include emissions from vehicles, dust from unsurfaced roads, cropland, construction sites, bare ground, campfires, prescribed fire, wildfire, and oil and gas developments. Oil and gas developments are regulated for emissions and required

to have emission controls in all three states. Emissions related to fire are regulated through state smoke management plans. Emissions from vehicles, dust, and campfires are not monitored, and there is no way to know the effect, range, or variation in these emissions. Prescribed fire is the most notable land management activity that takes place on the Grasslands that has implications on air quality; however, this has not contributed to long-term adverse air quality. All projects, including prescribed burns, must meet state air quality standards and smoke management plans once finalized.

## Energy Development, Minerals, and Special Uses

Energy and minerals development is authorized by the special use program. Analysis of consequences has been based on Forest Service Manual direction and sound professional judgment. Additionally, as part of the analysis process, resources from various agencies such as USDI Bureau of Land Management's "The Gold Book," were consulted. U.S. Fish and Wildlife Service and state guidelines were studied to analyze consequences to wildlife from wind turbines, raptor protection on power lines, and potential impacts to federally listed species and migratory birds. The "Transportation and Utilities Corridors" map of the plan was also utilized.

The Department of Energy National Renewable Energy Laboratory map dated January 15, 2010, found on the NREL Web site, indicates that areas which exceed 6.5 m/s minimum wind speed at 80 m above ground level (AGL) are potential areas that are highly desirable for wind energy development. The majority of Federal lands of the Grasslands are within this category.

Analysis of alternatives on the minerals resource of the Grasslands was based on regulations found within 36 CFR 228, personnel communication with Grasslands district rangers, department managers, and other Forest Service personnel, as well as with the USDI Bureau of Land Management.

## Wildland-Urban Interface and Fire Management

A fire regime condition class (FRCC) is a classification of the amount of departure from the natural regime. Coarse-scale FRCC classes have been defined and mapped and include three condition classes for each fire regime. The classification is based on a relative measure describing the degree of departure from the historical natural fire regime. This departure results in changes to one (or more) of the following ecological components: vegetation characteristics (species composition, structural stages, stand age, canopy closure, and mosaic pattern); fuel composition; fire frequency, severity, and pattern; and other associated disturbances (e.g. insect and disease mortality, grazing, and drought). There are no wildland vegetation and fuel conditions or wildland fire situations that do not fit within one of the three classes.

The three classes are based on low (FRCC 1), moderate (FRCC 2), and high (FRCC 3) departure from the central tendency of the natural (historical) regime. The central tendency is a composite estimate of vegetation characteristics (species composition, structural stages, stand age, canopy closure, and mosaic pattern); fuel composition; fire frequency, severity, and pattern; and other associated natural disturbances. Low departure is considered to be within the natural (historical) range of variability, while moderate and high departures are outside.

Characteristic vegetation and fuel conditions are considered to be those that occurred within the natural (historical) fire regime.

In general throughout all of the Grasslands vegetation types, FRCC is estimated to be in the following percentages: 60 percent FRCC 1, 35 percent FRCC 2, and 5 percent FRCC 3. This relates to the Grasslands with average fire return intervals of 2 to 20 years, most likely less than 10 years. This return interval may be longer in the cottonwood-willow areas along rivers, streams, and in the pinyon-juniper savannas, but most likely less than 35 years. The large landscape historical fires are now hampered by broken landscapes (roads, agriculture fields, urban development, etc.).

# Vegetation Types and Associated Wildlife Habitat

## Ecological Sustainability

The "Ecological Sustainability Report" (ESR) (see the Web address provided in appendix B) evaluated the ecological systems of the Grasslands and the relationship to the surrounding area. The ESR provided the information needed to determine topics or issues needing revision from the existing LRMP for the Cibola National Forest (NF). It outlined and put into context the relationship between the resources managed by the Grasslands and the broader ecological environment. The ESR has two main sections, ecosystem diversity and species diversity. The "Ecosystem Diversity" section discusses conditions and trends in the vegetation communities and physical resources based on the reference condition of each vegetation type. Appendix F of the ESR supplements the information found in the "Ecosystem Diversity" section of the ESR. Specifically, it outlines the current and historical conditions for shortgrass prairie, pinyon-juniper, cottonwood-willow riparian, sand sagebrush, mixed-grass prairie, shinnery oak, and mixed hardwood riparian vegetation types.

The condition and trends in the Grasslands vegetation communities are evaluated on a 5- to 10-year interval using field reconnaissance, visual obstruction readings, Parker 3 Step transects, cover-frequency transects, production clippings, photo points, and composition inventories. Data collected has been compared with historical data and with the terrestrial ecological unit inventory.[5]

In order to determine the class of departure for a vegetation type, the mid-scale[6] vegetation found within each vegetation type was placed into a class[7] based on the information in the reference condition model. A comparison was made of the current percentage to the historical percentage for each class within the model. The lesser of the two percentages (current vs. historical) was subtracted from 100 for each class. The resulting number determined the level of departure from the historical reference conditions as follows:

- 0–33 percent = Low departure
- 34–66 percent = Moderately departed

[5] Terrestrial ecosystem unit inventory consists of mapping and interpreting ecosystems through a systematic examination, description, classification, and integration of the soil, vegetation, and climate on national forests and grasslands.

[6] Mid-scale mapping is a remote sensing and modeling effort used to provide periodic snapshots of existing vegetation for forest plan implementation and monitoring. Mid-scale is an object-oriented approach using image segmentation and various classification methodologies to model vegetation dominance type, canopy cover class, and size.

[7] There are three classes of departure from reference condition—low departure, moderately departed, and severely departed.

- 67–100 percent = Severely departed

All the vegetation types on the Grasslands are in low departure from reference condition for vegetation structure.

Habitats for wildlife, fish, and rare plants that exist within the Grasslands are discussed in the "Species Diversity" section of the ESR.

## Species Viability

Section 219.19 (Fish and Wildlife Resources) of the 1982 Planning Rule states: "Fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired nonnative vertebrate species in the planning area. For planning purposes, a viable population shall be regarded as one which has the estimated numbers and distribution of reproductive individuals to insure its continued existence is well distributed in the planning area. In order to insure that viable populations will be maintained, habitat must be provided to support, at least, a minimum number of reproductive individuals and that habitat must be well distributed so that those individuals can interact with others in the planning area."

Species viability risk assessments methodology and process are described in detail in appendix F of this FPEIS.

## Shelterbelt Acreage and Linear Extent Computation

Estimates of acreage and linear extent of shelterbelts or windbreaks on the BK NG and adjacent private lands was used to evaluate issues of tree encroachment on mixed-grass prairie and shinnery oak vegetation types. Through the use of orthographic photos, spatial orientation, area determination, and frequency analysis was completed on private land adjacent or within 1 mile of BK units, amounting to a total of 2,040 acres of shelterbelts with a linear extent of 121 miles. BK NG units totaled 156 acres of shelterbelts covering 12 linear miles.

## Black-tailed Prairie Dog Colony Acreage Computation

Acreage estimates of prairie dog colony expansion trends were formulated by summarizing the areas that dog colonies have previously occupied by soil type and comparing those sums with the total acreage the colonies covered each year. A final average was then taken for each soil type. Soils with area greater than 10 percent of the total of all occupied soils were considered as high occupancy soils. High occupancy soils determination did not consider aspect, slope, or surroundings such as water tanks, roads, etc. The following bulleted list depicts acreage of high occupancy soils:

- Rita Blanca in TX: 42,682 acres total; 16,669 acres of high occupancy soils (39 percent of total).
- Kiowa in NM: 57,379 acres total; 22,389 acres of high occupancy soils (39 percent of total).
- Rita Blanca in OK: 15,718 acres total; 7,032 acres of high occupancy soils (45 percent of total).

There are potential environmental consequences of black-tailed prairie dog effects to soil fertility and susceptibility to erosion, both negative and positive, although the extent is not well studied or known.

## Analysis and Evaluation Matrix

Following is the evaluation matrix used by Forest Service specialists to evaluate accomplishment of desired alternatives and environmental consequences by alternative.

| **Alternatives Comparison Table 1**<br>**Specialist:**<br>**Planning Core Team Liaison:**<br>**Resource Area:** | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Alternative A (No Action – Current Plan –Current Management)** | | **Alternative B Revised Plan (Desired Condition for Your Resource Area)** | | | **Alternative C - Revised Plan but With Wilderness** | | |
| Compare the objectives, standards, guidelines, management approaches, suitability, and monitoring components of the current plan related to your resource area against the same resource area DCs of the revised plan…What are the outcomes or consequences? (answer largely available from ESR, SESR, CER) | **Important** Consequences? Yes/No?<br>Explain | What is/are the change in plan components relative to your resource area from alternative A? | Potential for consequences of change between alternatives A and B relative to your resource area? | Important consequences? Yes/No?<br>Explain | Change in plan components relative to your resource area from those of alternative B? Note: Should be no change except for wilderness related issues at the Canadian River/Mills Canyon area. | Potential for Consequences of change between alternatives B and C relative to your resource area? | Important consequences? Yes/No?<br>Explain |

**Interdisciplinary Consequences Table 2**
**Specialist:**
**Planning Core Team Liaison:**
**Resource Area:**

| | | **Alternative A No Action – Current Plan – Current Management** | | **Alternative B Revised Plan** | | **Alternative C Revised Plan but With Wilderness** | |
|---|---|---|---|---|---|---|---|
| Revision Topic | Page Number(s) of Plan Components in Revised Plan | Do plan components of other resource areas in alternative A have consequences to achieving the DC of your resource area in alternative B? Yes/No? | Are they Important Consequences? Yes/No? Explain | Do plan components of other resource areas in alternative B have consequences to achieving the DC of your resource area in alternative B? Yes/No? | Are they Important Consequences? Yes/No? Explain | Do plan components of other resource areas in alternative C have consequences to achieving the DC of your resource area in alternative B? Yes/No? | Important Consequences? Yes/No? Explain |
| Scenery | Pages 12, 35, 47, 71, 72, 73 of revised plan | | | | | | |
| General Recreation | Page 14 | | | | | | |
| Developed Recreation | Pages 14, 36, 65 | | | | | | |
| Dispersed Recreation | Pages 17, 37, 48, 65 | | | | | | |
| Motorized Recreation | Pages 18, 38, 49 | | | | | | |
| Natural Tourism | Page 19 | | | | | | |

**Interdisciplinary Consequences Table 2**
**Specialist:**
**Planning Core Team Liaison:**
**Resource Area:**

| | | **Alternative A No Action – Current Plan – Current Management** | | **Alternative B Revised Plan** | | **Alternative C Revised Plan but With Wilderness** | |
|---|---|---|---|---|---|---|---|
| Heritage Resources | Pages 20, 38, 49 | | | | | | |
| Roads and Access | Page 21 | | | | | | |
| Land Adjustments | Pages 23, 49 | | | | | | |
| Minerals and Energy Development (oil and gas) | Pages 24, 39, 49 | | | | | | |
| Special Uses | Page 26, 27 | | | | | | |
| Wind Energy Development | Page 27, 28 | | | | | | |
| Livestock Use | Page 28, 50 | | | | | | |
| Wildland Urban Interface | Page 29 | | | | | | |
| General Ecological | Page 29, 30 | | | | | | |
| Soil, Water, Air, Watershed, Streams | Page 30, 31, 32, 33, 40, 52 | | | | | | |
| Invasives | Page 34, 41 | | | | | | |
| Forest Products | Page 25, 26 | | | | | | |

| **Interdisciplinary Consequences Table 2**<br>**Specialist:**<br>**Planning Core Team Liaison:**<br>**Resource Area:** | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | **Alternative A No Action – Current Plan – Current Management** | | **Alternative B Revised Plan** | | **Alternative C Revised Plan but With Wilderness** | |
| Shinnery Oak and Inclusions | Page 43, 44, 45 | | | | | | |
| Mixed Grass | Page 41, 42, 54, 55 | | | | | | |
| Mixed Riparian Hardwood | Page 45, 46 | | | | | | |
| Shortgrass and Inclusions | Page 52, 53, 54, 55, 56, 57, 58 | | | | | | |
| Sand Sagebrush | Page 61, 62, 63 | | | | | | |
| Piñon-Juniper | Page 58, 59, 66, 67 | | | | | | |
| Cottonwood-Willow | Page 60, 61, 68, 69 | | | | | | |
| Wildlife Habitat Improvement | Page 39, 40, 50, 51 | | | | | | |
| Special Areas | Pages 70, 71, 72, 73 | | | | | | |
| Integrated Social Economic Mills Canyon | Pages 64, 65 | | | | | | |

# Appendix K. Coordination with Other Public Planning Efforts

## Summary

Per the 1982 Planning Rule Provisions, the responsible official shall review the planning and land use policies of other Federal agencies, state and local governments, and Indian tribes. This document, along with other planning efforts, contributes to that requirement.

Ecosystem restoration and resilience will be a main focus in the proposed plan. Forest Service Chief Tom Tidwell has called for an "all-lands approach" to accomplish ecosystem restoration. This will involve landowners and stakeholders working together across boundaries to decide on common goals for the landscapes they share.

In order to facilitate this "all-lands approach," it is important to understand the goals and anticipated activities of our adjacent landowners. The following sections provide a summary of those goals and activities.

## Counties

The Kiowa and Rita Blanca (KRB) and Black Kettle and McClellan Creek (BKMC) National Grasslands (NGs) reside in nine counties spanning three states. The Kiowa (K) NG, which covers 137,537 acres is located within Mora, Harding, Union, and Colfax Counties, NM; the Rita Blanca (RB) NG, which covers 92,989 acres is located within Dallam County, TX, and Cimarron County, OK; the Black Kettle (BK) NG, which covers 31,286 acres is located within Roger Mills County, OK, and Hemphill County, TX; and the McClellan Creek (MC) NG covers 1,449 acres in Gray County, TX.

County comprehensive plans can be used as a source of information on the history of land use within the region, the patterns of development, desired conditions, and current county land use policies. County governments hold no legal authority over independent jurisdictions such as Federal and state lands, incorporated cities and towns, or Native American tribal reservations.

Farming and ranching are the typical land uses in the nine counties in which the Grasslands reside. At the time this document was prepared, only two counties—Colfax and Mora Counties, NM—have comprehensive land use plans. It should be noted that none of the states where the Grasslands are located require local governments to have these types of plans in place, and it is typical of small rural counties not to have developed them.

The Kiowa NG under Forest Service administration has 4 sections or about 2,560 acres within Colfax County. Similarly, the Kiowa NG under Forest Service administration has about 5,874 acres within Mora County.

### Colfax County Comprehensive Plan, 2004

Colfax County, NM, has the following goals for resource topics that are relevant to the proposed Grasslands plan:

- Increase level of cooperation in planning land uses adjacent to public Forest lands.
- Support ranching and agricultural land use that enhances the open lands and rural lifestyle.

- New developments will respect the topography and be in scale with the mesas and mountains.
- Maintain high water quality standards.
- Recognize and protect existing water rights.
- Implement water conservation practices.
- Develop water use restrictions.
- Strengthen the county's role in state and Federal decisions that affect natural resources, endangered species, and water.
- Encourage economic development that does not adversely affect the natural beauty of the county.
- Create and provide a stable wage base.
- Sustain existing agriculture and other economic opportunities.
- Provide economic development to assist existing businesses.
- Enhance and grow existing businesses.
- Foster economic development that promotes sustainable and environmentally friendly forest and land health.
- Establish Colfax County as a tourist destination.
- Enhance and expand the scenic roadways system in the county, including the Santa Fe National Historic Trail.

After reviewing the "Colfax County Comprehensive Plan," it is determined that the proposed Grasslands plan is not in conflict with the goals of Colfax County as listed above. Activities that led to development of the proposed Grasslands plan were coordinated to the extent practicable with owners of lands that are intermingled with, or depend upon, National Forest System lands for access.

## Mora County Comprehensive Plan, 2009

Mora County, NM, has the following goals for resource topics that are relevant to the proposed Grasslands plan:

- Historic and cultural ties to the land should be protected.
- Land use regulations should continue to protect the county's rural character and natural resources.
- The county will improve the appearance of Mora County while ensuring the health and safety of its residents. Such efforts will focus on highly visible locations along road corridors and in traditional villages.
- The county will attempt to reduce greenhouse gas emissions.
- The water resources of Mora County should be protected and preserved for our agriculturally based communities.

- The county will achieve a sustainable forest ecosystem.
- The county will foster opportunities for sustainable economic growth.
- Solid waste should be managed in an environmentally and economically sound manner.
- A safe, cost efficient and well-designed roadway system should be provided countywide.
- Scenic roadways should be maintained and enhanced to preserve the special rural character of Mora County.
- Wastewater should be managed in an environmentally sound manner to protect water quality and the health, safety, and general welfare of residents.
- Drinking water supplies should be protected from degradation and contamination.
- Fire protection should be improved throughout the county.
- Regulations and enforcement of land uses should be fair, consistent, and informative.
- County government should foster open and effective channels of communication.

After reviewing the "Mora County Comprehensive Plan," it is determined that the proposed Grasslands plan is not in conflict with the goals of Mora County as listed above. Activities that led to development of the proposed Grasslands plan were coordinated to the extent practicable with owners of lands that are intermingled with, or depend upon, National Forest System lands for access.

### Harding County Land Use Policy Plan, 1995

Harding County, NM, has the following policies for resource topics that are relevant to the proposed Grasslands plan. These interim land use planning mechanisms focus on Federal and state land use and activities.

- Design and development of all Federal and state land disposal will be carried out to the benefit of the citizens of Harding County.
- Protection and development of water resources are essential to the county's economic and cultural viability.
- Protect agricultural land and promote the continuation of agricultural pursuits.
- Protect timber resources and promote sustainable wood products industry.
- Promote public and private recreational, cultural, wilderness, and wildlife opportunities.
- Provide for the long-term availability and development of oil, gas, and mineral resources.
- Landmarks or trails shall not entail encumbrances or restrictions of private property rights.
- Access across Federal and State lands shall not entail encumbrances or restrictions on private property rights.
- Ensure consistency between Federal and State activities with the land use requirements enumerated within the interim plan.

After reviewing the "Harding County Interim Land Use Policy Plan," it is determined that there are inconsistencies between the Harding County plan and the wilderness alternative as presented in the draft EIS. However, inconsistencies between the Harding County plan and the preferred alternative, the draft land and resource management plan, are less pronounced. Activities that led to development of the proposed Grasslands plan were coordinated to the extent practicable with owners of lands that are intermingled with, or depend upon, National Forest System lands for access. County governments hold no legal authority over independent jurisdictions such as Federal and state lands, incorporated cities and towns, or Native American tribal reservations. These lands will be managed consistent with established governing legislation.

## Harding County Environmental Planning and Review Process, 1995

Harding County, NM, has the following objectives for resource topics that are relevant to the proposed Grasslands plan. Primary objectives of the environmental planning and review process are to achieve coordination and consistency with Federal and State plans that effect or are located within Harding County.

- Disclose the significant environmental effects of proposed government actions on nature, social, cultures, customs, property rights, and economic stability.
- Avoid or reduce damage or negative impacts to the environment.
- Prevent damage or negative impacts by requiring implementation of feasible alternatives or mitigation measures.
- Foster intergovernmental coordination.
- Enhance public education and participation.
- Enhance the county commission's capability to plan and manage resources for the public good.

After reviewing the "Harding County Environmental Planning and Review Process," it is determined that the proposed Grasslands plan is not in conflict with the goals of Harding County as listed above. Activities that led to development of the proposed Grasslands plan were coordinated to the extent practicable with owners of lands that are intermingled with, or depend upon, National Forest System lands for access. However, county governments hold no legal authority over independent jurisdictions such as Federal and State lands, incorporated cities and towns, or Native American tribal reservations. These lands will be managed consistent with established governing legislation.

## Union County Comprehensive Plan, 2002

Union County, NM, has the following goals for resource topics that are relevant to the proposed Grasslands plan:

- Economic Policy goals:
    - Broaden cultural and recreational opportunities, and enhance its appearance to support economic growth.
    - Build upon the county's visitor industry potential.
    - Preserve, improve, and promote its scenic and historical assets.

  - Promote and facilitate development of alternative energy.
  - Insure that the Ports-to-Plains highway is developed through the county.

- Land use and natural resource goals carried forward from the Union County 1995 Comprehensive Plan:
  - Federal and State land transactions will be carried out to the benefit of the citizens of Union County.
  - Maintain a sustainable 40-year water supply through stewardship and conservation.
  - Support the exploration of oil, gas, and mineral resources.
  - Protect timber resources.
  - Encourage private use of wood products consistent with multiple uses and good silvicultural practices.
  - Increase employment and profitability by diversifying agricultural enterprises.
  - Promote and facilitate recreational, cultural, and wilderness opportunities.
  - Take initiative in designation of historic landmarks or trails.

After reviewing the "Union County Comprehensive Plan," it is determined that the proposed Grasslands plan is not in conflict with the goals of Union County as listed above. Activities that led to development of the proposed Grasslands plan were coordinated to the extent practicable with owners of lands that are intermingled with, or depend upon, National Forest System lands for access.

## Community Wildfire Protection Plans (CWPPs)

CWPPs are developed by communities in response to the Healthy Forests Restoration Act of 2003 (HFRA). HFRA requires Federal agencies to collaborate with communities in developing hazardous fuel reduction projects and places priority on treatment areas identified by communities through the development of a CWPP. A primary objective of a CWPP is to help local governments, fire departments and districts, and residents identify at-risk public and private lands to better protect those lands from severe wildfire threat. Additional functions of a CWPP are to improve fire prevention and suppression activities, as well as to identify funding needs and opportunities to reduce the risk of wildland fire and enhance public and firefighter safety. Identifying at-risk areas and improving fire protection capabilities helps communities prioritize high risk projects and expedites overall project planning. These plans are used by Grasslands land managers to help prioritize areas for hazardous fuel reduction treatments adjacent to at-risk communities.

Currently, two community wildfire protection plans (CWPP) outline goals for at-risk-communities within and around the Kiowa NG. These plans are:

- Harding County, NM, Community Wildfire Protection Plan, May 2008
- Union County, NM, Community Wildfire Protection Plan, June 2008

After reviewing the above CWPPs, it is determined that the proposed Grasslands plan is congruent with the goals and planned strategies and activities of the two CWPPs.

No other counties in New Mexico have at-risk communities within or around the Grasslands. No counties within or around the three national grasslands in Texas or Oklahoma have CWPPs.

## Tribes

Tribes are legally considered to be sovereign nations, so the relationship between the FS and tribes is a government-to-government relationship. Tribes that enter into contracts with the Federal government do so just as state governments or sovereign nations do.

The Federal government holds a special responsibility to consult with tribes over management issues that may affect them. This process is governed by a variety of Federal regulations and policies, including the Forest Service Handbook (FSH 1509.13), the National Environmental Policy Act, the National Indian Forest Resources Management Act, the Tribal Forest Protection Act, the Archaeological Resources Protection Act, and several presidential executive orders.

The seven tribes with whom we consult on the KRB and the BKMC NGs (herein collectively referred to as the "Grasslands") are the Jicarilla Apache, Mescalero Apache, Cheyenne and Arapaho Tribes, Apache Tribe of Oklahoma, Comanche Nation, Kiowa Tribe, and Wichita and Affiliated Tribes. These tribes are known to have had historical connections to the land currently designated as the Grasslands before European settlement. However, no tribal trust lands are adjacent to or nearby the Grasslands.

The Cibola National Forest and Grasslands first notified the tribes of Grasslands plan revision in the annual letters and list of projects sent out February 27, 2006, and initiated face-to-face meetings later that year. We have continued that process annually with the status of plan revision updated every year. The Cibola National Forest has had face-to-face meetings with all seven tribes for one or more years concerning plan revision.

## New Mexico, Oklahoma, and Texas Wildlife and Fish Agencies and State Wildlife Action Plans

Land and resource management plan revision on the Grasslands considered and utilized results from the comprehensive wildlife conservation strategies (CWCS) for New Mexico, Oklahoma, and Texas. These strategies were developed by the respective state wildlife and fish agencies. The focus of these strategies is upon species of greatest conservation need (SGCN) and key wildlife habitats. The strategies assessed the condition of key habitats, SCGN, problems affecting species and habitats, desired future conditions, and prioritized conservation actions and monitoring needs. The overriding desired outcome is that the key habitats persist in the condition, connectivity, and quantity necessary to sustain viable and resilient populations of resident SGCN and host a variety of land uses with reduced resource use conflicts.

Each of the three states CWCS desired outcomes was designed to conserve indigenous threatened or endangered wildlife and habitats to assure biodiversity.

In developmental stages of Grasslands plan revision, the CWCS were referenced and high priority SGCN were included in the species lists identified for the Grasslands plan revision and evaluated for viability in the "Ecological Sustainability Report."

Development of plan components is a process and outcome similar to CWCS development and desired outcome determination. The Grasslands evaluated ecological sustainability through assessing vegetation type relationships to key habitat sustainability for associated species.

Phase 2 of the Grasslands draft land and resource management plan revision included developing a set of plan components that include:

- Desired conditions of vegetation components;
- Objectives that have timeframe and measurable outcomes defined; and
- Guidelines that provide restrictions and/or limitations on management or activities.

The Grasslands draft land and resource management plan will compliment the New Mexico, Oklahoma, and Texas CWCS desired outcomes and benefit the SGCN through key habitat management on the Grasslands.

## Oklahoma Commissioners of the Land Office (School Land Trust)

The Commissioners of the Land Office (CLO), better known as the "School Land Trust," is an Oklahoma State agency created by the original Oklahoma Constitution. The CLO is mandated to have charge of the sale, rental, disposal, and management of school lands and other public lands, and of the funds and proceeds derived thereof, under the rules and regulations prescribed by the Oklahoma legislature. The primary purpose of the CLO is to administer the school land trust funds for the production of income for the support and maintenance of the common schools and the schools of higher education. Lands of the CLO frequently border lands of the RB NG in Cimarron County, Oklahoma.

Within the CLO, the Minerals Management Division administers over 1 million mineral acres and minerals. The Real Estate Management Division has responsibility for over 700,000 surface acres. The CLO does not have a land management plan that guides management direction for Oklahoma State lands, but uses the USDA Natural Resources Conservation Service as an advisory agency (Randy Schreiner, CLO Real Estate Management Field Staff, pers. comm. July 29, 2011).

## Texas General Land Office

There are no Texas State lands adjacent to or nearby Federal lands of the Grasslands.

## New Mexico State Land Office

Lands of the New Mexico State Land Office frequently border parcels of the Kiowa NG in northeastern New Mexico. The Enabling Act of 1910 and the Ferguson Act granted certain lands held by the Federal government to the territory of New Mexico. Under the terms of these land grants, it was stipulated that such lands, totaling 13.4 million acres, were to be held in trust for the

benefit of the public schools and other specific beneficiary institutions. The land commissioner is charged with generating and maximizing revenue from state trust lands in order to support public education and other beneficiary institutions, while simultaneously striving to protect, conserve, and maintain the lands so they may be used by future generations. To maximize revenues, the land commissioner generates revenues by leasing lands for grazing, agriculture, commercial use, oil and gas drilling, mining, and other surface and subsurface activities. Management direction for New Mexico State lands is provided by the New Mexico Statewide Natural Resource Assessment (John Romero, Asst. Commissioner, Field Div., pers. comm., July 29, 2011).

## New Mexico, Oklahoma, and Texas Statewide Natural Resource Assessments

The draft "Land and Resource Management Plan for the Kiowa, Rita Blanca, Black Kettle, and McClellan Creek National Grasslands" (herein collectively referred to as the "Grasslands") acknowledges the resource concerns expressed in the statewide assessments of New Mexico, Oklahoma, and Texas, compiled by the respective state forestry agencies. The Grasslands plan complements how these assessments address those concerns. Specifically, the plan's all-lands approach dovetails with the cooperative, and collaborative approaches of New Mexico, Oklahoma, and Texas:

*Forest and Range Sustainability, Health, and Wildfire.* The plan's proactive approach to use thinning, prescribed burning, and selective harvest to achieve desired conditions for plant community composition and structure, including the restoration of a more historical fire regime with fewer catastrophic fires and less risk to the wildland-urban interface, creates mutual benefit with similar practices by non-Forest Service agencies in New Mexico, Oklahoma, and Texas. The creation of the Grasslands has mitigated the fragmentation that otherwise would have likely occurred under previous ownership and would have interfered with the unified, landscape-scale management practiced today.

*Invasive Species.* The plan directs for a landscape-scale approach to invasive species management similar to the statewide approaches of New Mexico, Oklahoma, and Texas, by controlling the same target species (e.g., Eastern redcedar, saltcedar) and using similar control measures.

*Water Quality and Quantity.* Hydrological processes are maintained or restored on the Grasslands through draft plan direction—as they would be under guidance of the New Mexico, Oklahoma, and Texas statewide assessments—through vegetation and soil management including the maintenance of adequate ground cover, increased infiltration, and reduced runoff. Groundwater recharge and surface water temperature, sediment loads, and nutrient levels all benefit as a result.

*Climate*. The plan's adaptive management strategy to maintain diverse, resilient plant communities that are responsive to short- and long-term climate change mirrors the management desires and approaches elsewhere in New Mexico, Oklahoma, and Texas.

The management approach directed by the plan is not only appropriate when practiced at the Grasslands scale, it creates increased, far-reaching benefits when synergistically met by similar management approaches on non-Forest Service lands in the vicinity of the Grasslands.

## Santa Fe National Historic Trail Comprehensive Management and Use Plan - National Park Service, May 1990

The Forest Service and National Park Service operate under a general agreement (January 2001) to implement the "Comprehensive Management and Use Plan for the Santa Fe National Historic Trail." The Santa Fe National Historic Trail was designated in 1987. Various portions of the trail route are administered by the Forest Service; including the segment on the Kiowa NG near Clayton, NM. The physical use of existing trail remnants for recreation or other purposes are normally discouraged. Where the resources are durable, limited nonmotorized visitor use is permitted. Where visitor use (hiking) may be sufficient to cause erosion, denudation of vegetation, or other damage, contemporary parallel trails may be developed to maintain existing ruts in their historical context.

## USDOT Federal Highway Administration, National Scenic Byways Program

The Forest Service is a National Scenic Byways Program government partner. The program is a grass-roots collaborative effort established to help recognize, preserve, and enhance selected roads throughout the United States.

The *mission* of the National Scenic Byways Program is to provide resources to the byway community to create unique travel experiences and enhance local quality of life through efforts to preserve, protect, interpret, and promote the intrinsic qualities of designated byways.

The Santa Fe National Scenic Byway traversing the Kiowa NG in New Mexico was designated in June 1998.

## New Mexico 2030 Statewide Multimodal Transportation Plan

The "New Mexico Department of Transportation Multimodal Transportation Plan" contains direction for transportation and tourism. Multidisciplinary partnerships exist between State, Federal, local and tribal entities, and nongovernmental organizations (NGOs) concerned with environmental and cultural resource protection, tourism, economic development, and transportation. The 2030 plan includes goals and objectives to combine scenic byways with state bicycle routes where appropriate to enhance recreation and tourism potential. The NM Tourism Department is promoting green tourism, including scenic byways, mountain bike, equestrian, and hiking access points among transportation-related infrastructure.

The scenic byways program was established by the Intermodal Surface Transportation Efficiency Act of 1991 to recognize roads having outstanding scenic, historic, cultural, natural recreation, and/or archaeology qualities. New Mexico now has 26 scenic byways, one of which is the La Frontera del Llano, which traverses the Kiowa NG.

## Transportation Coordination with Other Planning Organizations

*State of Texas.* The Federal Transportation Enhancement Act for the 21st Century identified corridors of national importance. U.S. 287 on the RB NG was identified as part of the "Ports to

Plains" corridor from Texas to Colorado. U.S. 54 and U.S. 87 through the RB NG are also routes of the "Ports to Plains" corridor.

*State of Oklahoma 2010-2035 Oklahoma Long Range Transportation Plan.* There are 87 high priority corridors across the country, 4 are in Oklahoma, but outside the BK or RB NGs.

*State of New Mexico Highway and Transportation Department, Long Range Comprehensive Transportation Plan Update, January 1999.* Within New Mexico, the Kiowa NG is contained within NMDOT District 4 and the Northeast Regional Planning Organization. There are no goals or objectives directly related to NFS land management.

## Bureau of Land Management

Portions of BLM lands administered by the Taos Field Office are located near or adjacent to the Kiowa NG. The 1988 "Taos Resource Management Plan" provides guidance to the district in the management of its resources. A draft 2010 "Taos Resource Management Plan" has not been finalized. The plan addresses the following issues: access, area of critical environmental concerns and other types of special management areas, off-highway vehicles, riparian areas, wildlife habitat, lands and realty, outdoor recreation and visual resource management, energy and minerals, cultural resources, soil erosion, vegetation, water resources, air quality, and paleontological resources.

The focus of active management includes riparian improvement treatments, wildlife habitat improvement projects (including prescribed fire and suppression), soil erosion reduction, land (vegetation manipulation) treatments (including mechanical, chemical or prescribed fire), and firewood cutting. The majority of the public lands are managed to limit off-highway vehicle use to existing roads and trails.

## U.S. Fish and Wildlife Service

The main role of the U.S. Fish and Wildlife Service (USFWS) is to administer the Endangered Species Act (ESA). Section 7(a)(1) of the ESA directs Federal agencies to aid in conservation of listed species and Section 7(a)(2) requires that agencies, through consultation with the USFWS, ensure that their activities are not likely to jeopardize the continued existence of listed species or adversely modify designated critical habitat. As projects and activities are planned, forest managers consult with the USFWS.

The USFWS also issues national polices to promote the conservation and recovery of listed species, including species recovery plans. The USFWS is in the process of developing a strategic plan to react to climate change.

The USFWS manages the National Wildlife Refuge (NWR) System; however, there are no refuges adjacent to the Grasslands. Cibola NF and NGs cooperates closely with the USFWS, especially in endangered species protection and fire management activities.

## Playa Lakes Joint Venture (PLJV)

The PLJV is a nonprofit partnership of Federal and state wildlife agencies, conservation groups, private industry, and landowners dedicated to conserving bird habitat in the Southern Great

Plains. They provide science-based guidance and decision support tools for all bird conservation throughout the region, as well as outreach, coordination, and financial support to partners and local groups to conduct on-the-ground habitat work.

The "Playa Lakes Joint Venture Master Plan" is a strategic document that directs the overall activities of the joint venture and establishes measures of achievement. The master plan differs from this "PLJV Implementation Planning Guide" (guide) in that it provides a framework not only for biological planning, but also for all other elements that are essential for a successful joint venture. These elements are major areas of PLJV activity, and include conservation delivery, biological planning, communications, funding, granting, education, research, and annual review. The master plan is broad and describes the biological planning process in general. The guide provides more details of the planning process and emphasizes planning results, especially habitat conservation objectives.

There are 113 playa and alkaline lakes on the KRB NGs in New Mexico, Oklahoma, and Texas that provide unique bird habitat on the Southern Great Plains.

## Other Landowners

The four national grasslands border and surround other ownerships besides those listed above. There is no known inventory of these landowner's activities and potential impacts to the Grasslands.

## Conclusion

As identified above, other landowners and land policies have the potential to impact the Grasslands and vice-versa. In development of the land management plan, these considerations have been taken into account. The following table identifies some of the key potential impacts and how the plan deals with those impacts, as well as potential activities on adjacent lands that may impact Grasslands management. No major conflicts with Forest Service planning have been identified at this time.

**Table 1. Potential impacts to Grasslands management and relationship to the proposed plan**

| Potential Impacts/Issues | How the Proposed Plan Addresses |
|---|---|
| Call for multiple use of the Grasslands | The overall goal of managing National Forest System lands is to sustain the multiple uses of its resources in perpetuity while maintaining the long-term productivity of the land. The plan carries out that goal. |
| Community growth demand | The plan identifies a management emphasis to work with local communities to understand their community expansion needs and retain access to NFS land. |
| Danger from fire for residents living in a wildland-urban interface | The plan contains goals and objectives for effective treatments that will ensure that fires, when they do occur, are low to moderate severity; and that residents have the information they need to protect themselves and their property from fire and other risks in the wildland-urban interface. |
| Improve Grasslands' health and promote the restoration of Grassland ecosystems | The desired conditions describe healthy, sustainable Grasslands, and the objectives identify actions that will help restore ecosystems. |

| Potential Impacts/Issues | How the Proposed Plan Addresses |
|---|---|
| Maintain healthy, sustainable Grasslands that provides forest products for communities | The desired condition describes a sustainable supply of wood products (e.g., small roundwood, sawlogs, biomass, firewood) and other products (e.g., cactus, ferns, and fungi) are provided within the capacity of the land to produce these goods. Silvicultural treatments reflect natural disturbance regimes and contribute to ecosystem sustainability. Forest products, particularly those related to wood fiber, are made available as part of fuel or invasive species treatment projects and restoration activities. |
| Support local, traditional custom, and culture | The uses of livestock grazing, tree harvesting, mining, and hunting continue to be allowed in the plan. The plan recognizes that many local residents have traditional ties, such as forest product collection, hunting, holiday celebrations, and annual picnics. Ranchers continue to be an important part of the Grasslands history and their traditional uses remain an important part of the economic and cultural landscape. |
| Protect private property rights | The plan honors the continuing validity of private, statutory, or preexisting rights. |
| Consider local concerns; collaborate with government agencies; consult with tribes | Throughout the plan, there is management emphasis on collaboration and cooperation with Federal, state, local governments, tribes, and stakeholders. |
| Growing demand for recreation (trails, designated OHV) | The plan offers a spectrum of recreation settings and opportunities varying from semiprimitive to urban and dispersed to developed, with an emphasis on the natural appearing character of the Grasslands.<br>Although the plan does not identify specific new developments, it does allow for it if needed. The plan focuses on maintaining existing recreation opportunities and improving their quality. |
| Tribal use and traditional cultural properties | The plan provides guidance for protecting historic and prehistoric properties and sites, including known American Indian sacred places and traditional cultural properties (TCPs), and for working with tribes to provide settings for tribal culture and uses. |
| Conserve, preserve, enhance, and restore wildlife and their habitat | The plan provides guidance for well-distributed habitat conditions that contribute to the recovery of federally listed species and restoring vegetation conditions that support all wildlife. |
| Minimize impacts from invasive species | The plan provides guidance for controlling or eradicating invasive species. |
| Provide opportunities for shooting sports, off-highway vehicles | The plan continues to allow these activities. |
| Threats related to changes in water availability | The plan provides guidance for protecting all water sources. |
| Threats related to changes in climate | The plan contains information and discussion about climate change and considerations for land management planning. |
| **Activities on Adjacent Lands that May Impact Grasslands Management** | |
| **Activity** | **Management Impact** |
| Land exchanges (changes in ownership) | Wildlife habitat, ecological services, access, scenery management |
| Sale of New Mexico or Oklahoma State lands | Access |

| Potential Impacts/Issues | How the Proposed Plan Addresses |
|---|---|
| Development | Wildlife habitat, ecological services, fire management, scenery management |
| Mining and quarrying | Wildlife habitat, scenery management |
| Noxious and invasive weed treatments | Invasive species management, fire management |

## References

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Texas Forest Service. 2009. Texas Statewide Assessment of Forest Resources: A comprehensive analysis of forest-related conditions, trends, threats, and opportunities. College Station, TX. 163 pp. http://txforestservice.tamu.edu/uploadedFiles/Sustainable/assessment/Texas%20State%20Assessment.pdf (Accessed February 22, 2011).

Texas Parks and Wildlife. 2005. Texas Comprehensive Wildlife Conservation Strategy. http://www.tpwd.state.tx.us/publications/pwdpubs/pwd_pl_w7000_1187a/

# Appendix L. Maps

## The maps in this appendix appear in this order:

National Grasslands Administered by Cibola National Forest Vicinity Map

Black Kettle and McClellan Creek Management Area

Black Kettle and McClellan Creek Proposed Scenic Integrity Levels

Black Kettle and McClellan Creek Recreation Opportunity Spectrum Classes

Black Kettle and McClellan Creek Vegetation Types

Kiowa and Rita Blanca Management Area

Kiowa and Rita Blanca Proposed Scenic Integrity Levels

Kiowa and Rita Blanca Recreation Opportunity Spectrum Classes

Kiowa and Rita Blanca Vegetation Types

Mills Canyon Management Area

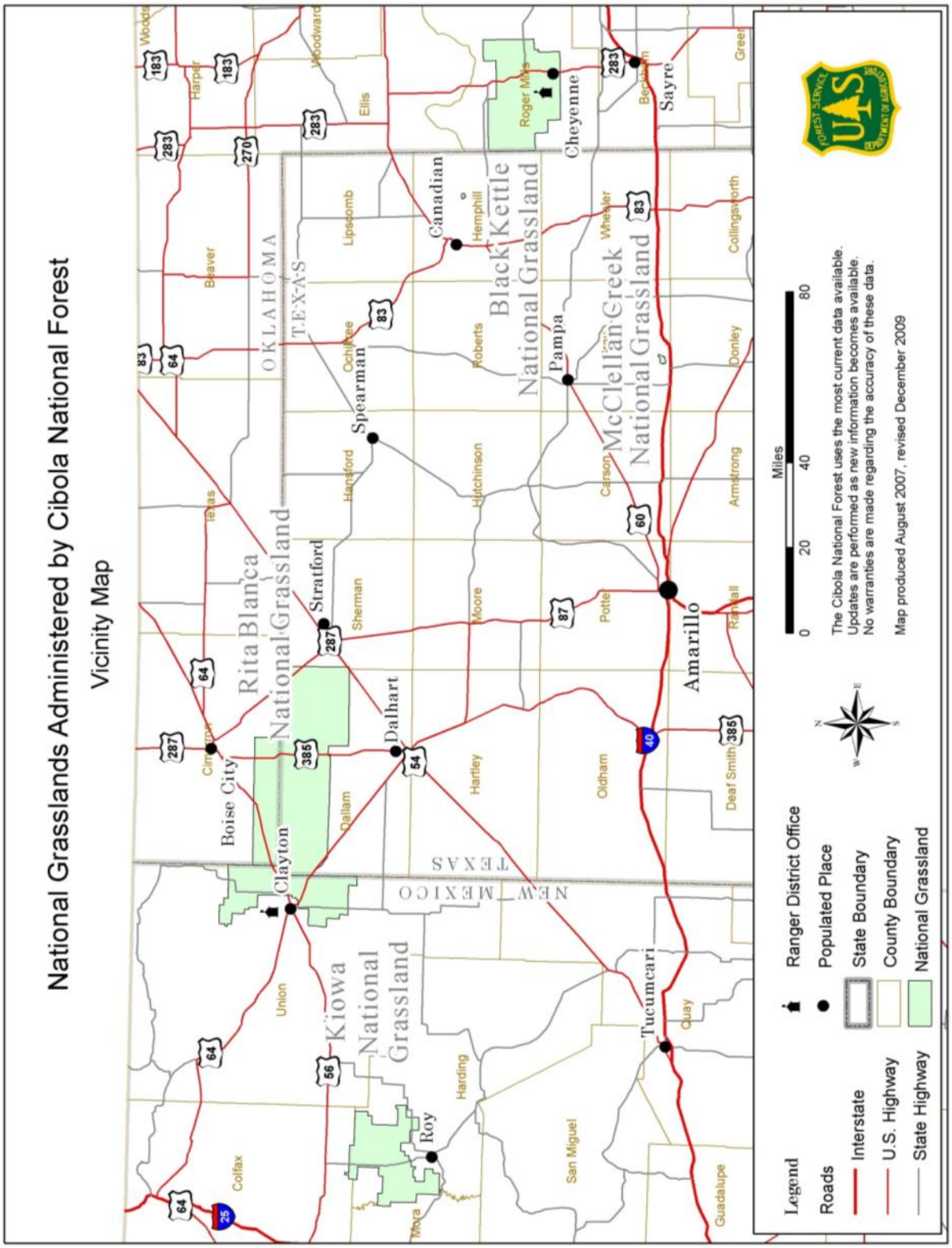
Mills Canyon Proposed Scenic Integrity Levels

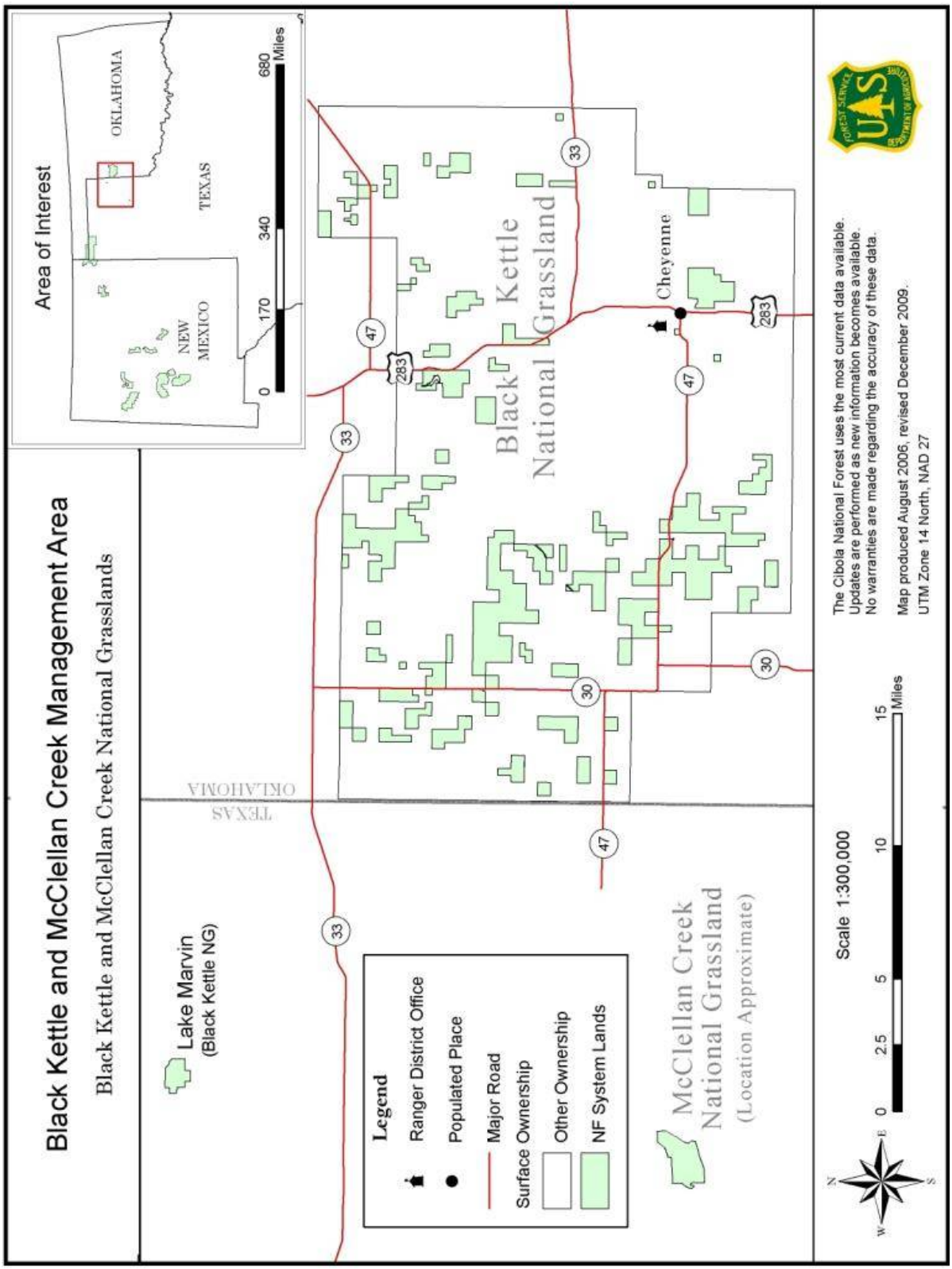
Mills Canyon Recreation Opportunity Spectrum Classes

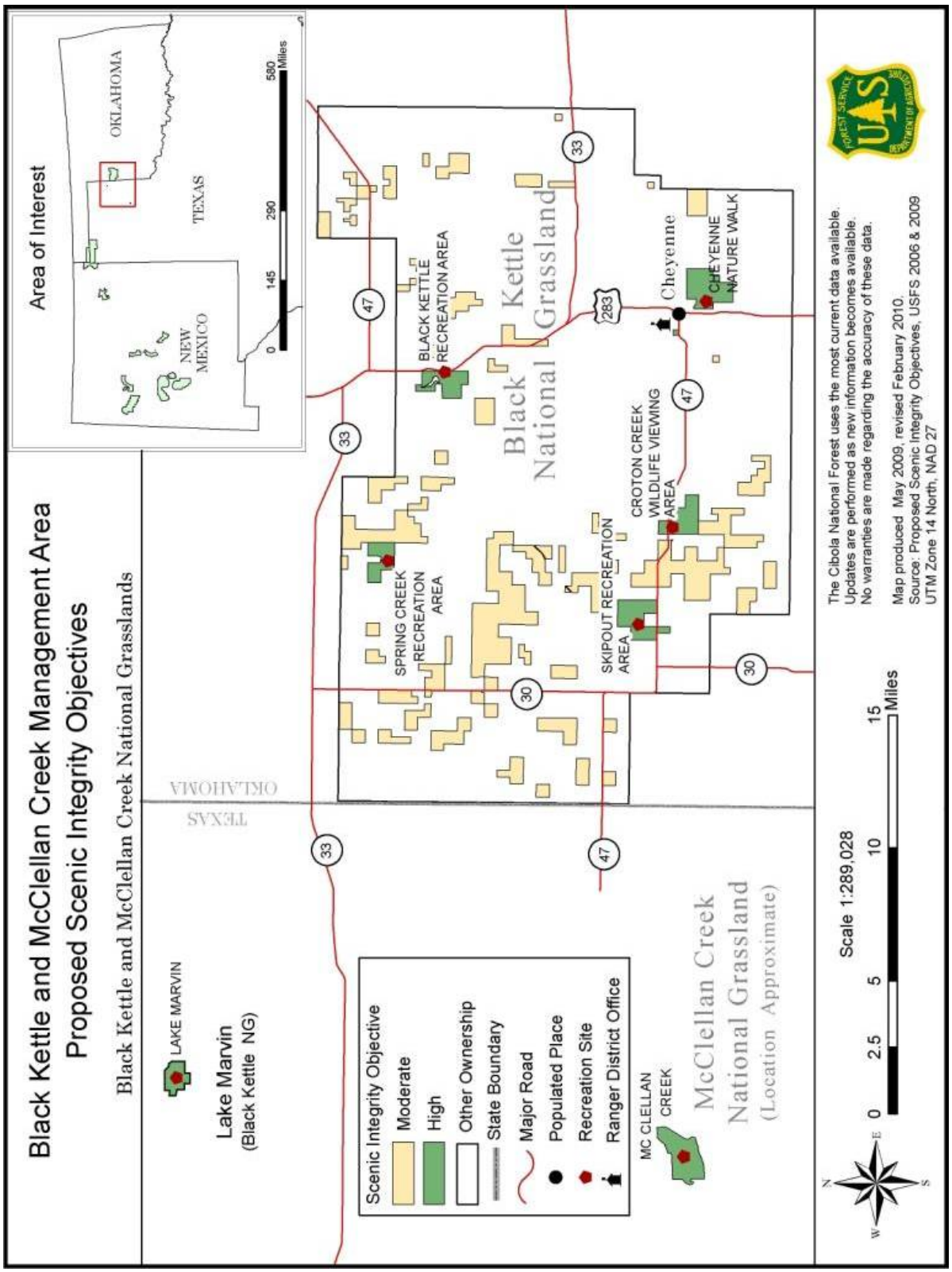
Mills Canyon Vegetation Types

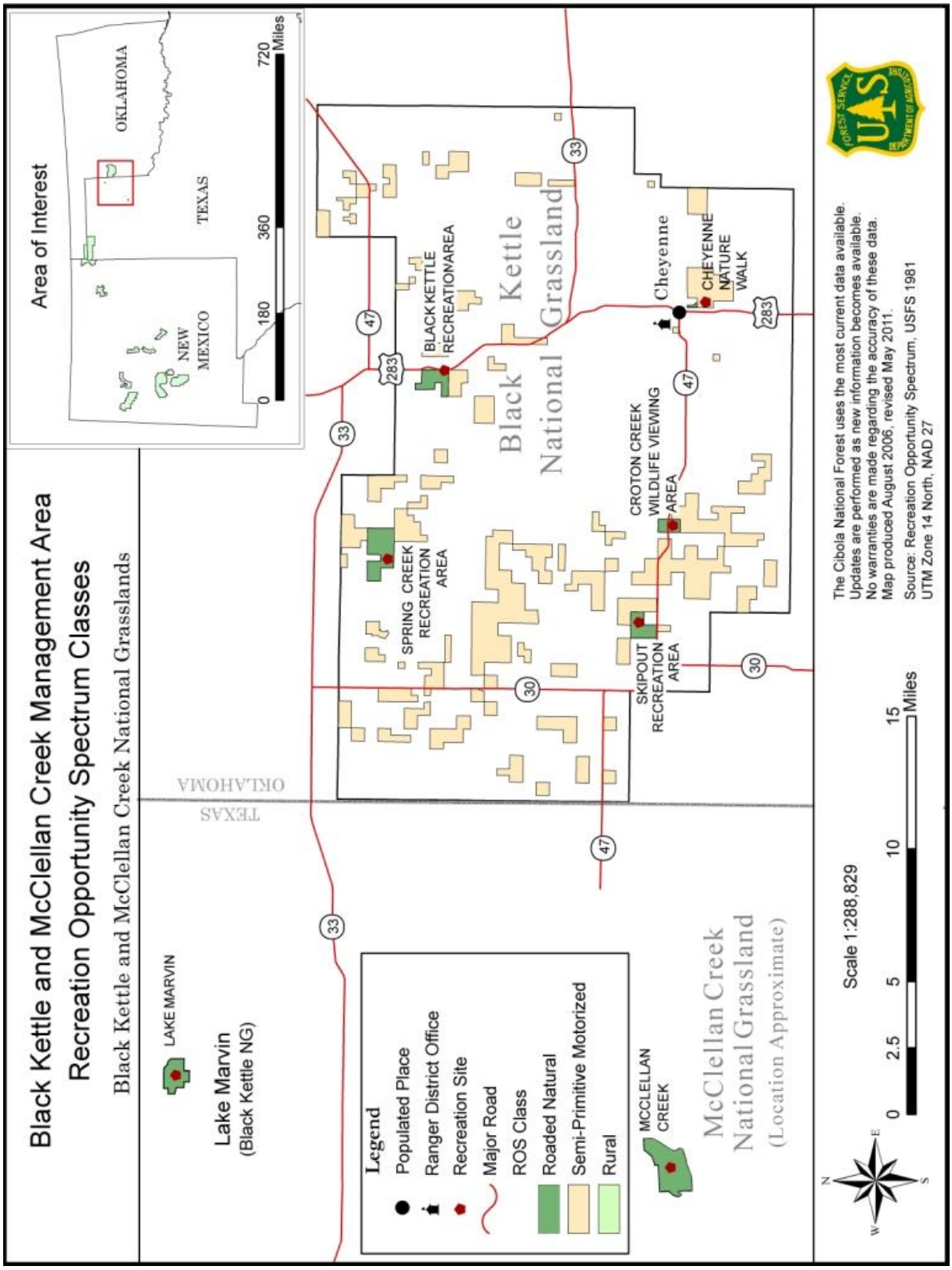
Special Areas and Eligible Scenic River

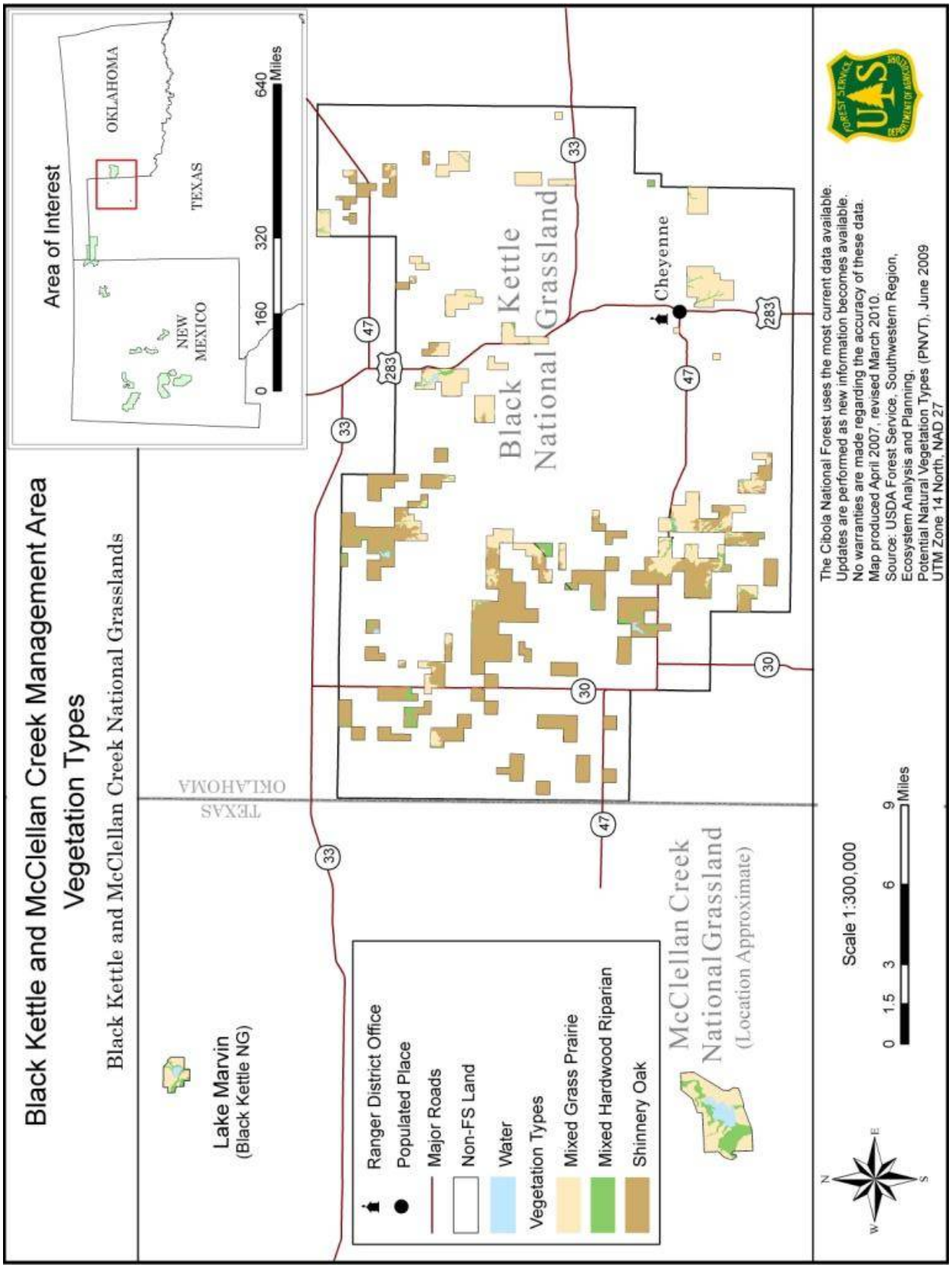
Mills Canyon Gas and Oil Surface Occupancy Restrictions


National Grasslands Administered by Cibola National Forest
Vicinity Map
Rita Blanca National Grassland
Kiowa National Grassland
Black Kettle National Grassland
McClellan Creek National Grassland
OKLAHOMA
TEXAS
NEW MEXICO
TEXAS
Boise City
Clayton
Stratford
Dalhart
Spearman
Canadian
Pampa
Cheyenne
Sayre
Amarillo
Tucumcari
Roy
Legend
Roads
Interstate
U.S. Highway
State Highway
Ranger District Office
Populated Place
State Boundary
County Boundary
National Grassland
Miles
0
20
40
80
The Cibola National Forest uses the most current data available.
Updates are performed as new information becomes available.
No warranties are made regarding the accuracy of these data.
Map produced August 2007, revised December 2009


Black Kettle and McClellan Creek Management Area
Black Kettle and McClellan Creek National Grasslands
Area of Interest
OKLAHOMA
TEXAS
NEW MEXICO
0
170
340
680
Miles
Lake Marvin
(Black Kettle NG)
Black Kettle National Grassland
Cheyenne
McClellan Creek National Grassland
(Location Approximate)
TEXAS
OKLAHOMA
33
47
283
30
Legend
Ranger District Office
Populated Place
Major Road
Surface Ownership
Other Ownership
NF System Lands
Scale 1:300,000
0
2.5
5
10
15
Miles
N
S
E
W
The Cibola National Forest uses the most current data available.
Updates are performed as new information becomes available.
No warranties are made regarding the accuracy of these data.
Map produced August 2006, revised December 2009.
UTM Zone 14 North, NAD 27


Black Kettle and McClellan Creek Management Area
Proposed Scenic Integrity Objectives
Black Kettle and McClellan Creek National Grasslands
Area of Interest
OKLAHOMA
TEXAS
NEW MEXICO
0
145
290
580
Miles
LAKE MARVIN
Lake Marvin
(Black Kettle NG)
Black Kettle National Grassland
BLACK KETTLE RECREATION AREA
SPRING CREEK RECREATION AREA
SKIPOUT RECREATION AREA
CROTON CREEK WILDLIFE VIEWING AREA
Cheyenne
CHEYENNE NATURE WALK
MC CLELLAN CREEK
McClellan Creek National Grassland
(Location Approximate)
33
47
30
283
Scenic Integrity Objective
Moderate
High
Other Ownership
State Boundary
Major Road
Populated Place
Recreation Site
Ranger District Office
Scale 1:289,028
0
2.5
5
10
15
Miles
N
E
S
W
The Cibola National Forest uses the most current data available.
Updates are performed as new information becomes available.
No warranties are made regarding the accuracy of these data.
Map produced May 2009, revised February 2010.
Source: Proposed Scenic Integrity Objectives, USFS 2006 & 2009
UTM Zone 14 North, NAD 27


Black Kettle and McClellan Creek Management Area
Recreation Opportunity Spectrum Classes
Black Kettle and McClellan Creek National Grasslands
Area of Interest
OKLAHOMA
TEXAS
NEW MEXICO
0
180
360
720
Miles
Legend
Populated Place
Ranger District Office
Recreation Site
Major Road
ROS Class
Roaded Natural
Semi-Primitive Motorized
Rural
LAKE MARVIN
Lake Marvin
(Black Kettle NG)
MCCLELLAN CREEK
McClellan Creek
National Grassland
(Location Approximate)
Black Kettle
National Grassland
BLACK KETTLE RECREATIONAREA
SPRING CREEK RECREATION AREA
CROTON CREEK WILDLIFE VIEWING AREA
SKIPOUT RECREATION AREA
Cheyenne
CHEYENNE NATURE WALK
33
47
283
30
Scale 1:288,829
0
2.5
5
10
15
Miles
The Cibola National Forest uses the most current data available.
Updates are performed as new information becomes available.
No warranties are made regarding the accuracy of these data.
Map produced August 2006, revised May 2011.
Source: Recreation Opportunity Spectrum, USFS 1981
UTM Zone 14 North, NAD 27


Black Kettle and McClellan Creek Management Area
Vegetation Types
Black Kettle and McClellan Creek National Grasslands
Area of Interest
OKLAHOMA
TEXAS
NEW MEXICO
0
160
320
640
Miles
Lake Marvin
(Black Kettle NG)
Black Kettle National Grassland
Cheyenne
McClellan Creek National Grassland
(Location Approximate)
OKLAHOMA
TEXAS
33
47
283
30
Ranger District Office
Populated Place
Major Roads
Non-FS Land
Water
Vegetation Types
Mixed Grass Prairie
Mixed Hardwood Riparian
Shinnery Oak
Scale 1:300,000
0 1.5 3 6 9
Miles
N
E
S
W
The Cibola National Forest uses the most current data available.
Updates are performed as new information becomes available.
No warranties are made regarding the accuracy of these data.
Map produced April 2007, revised March 2010.
Source: USDA Forest Service, Southwestern Region,
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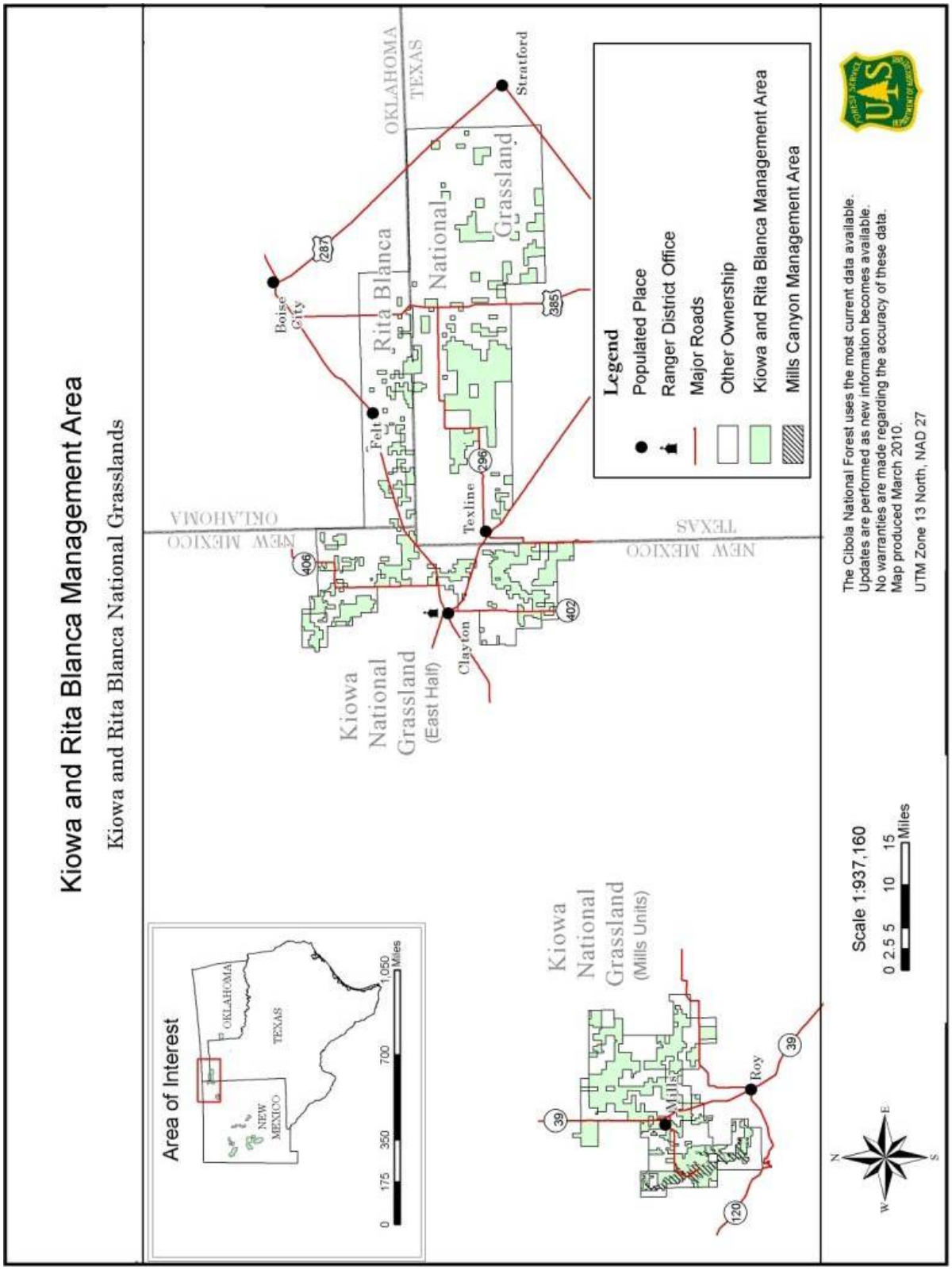
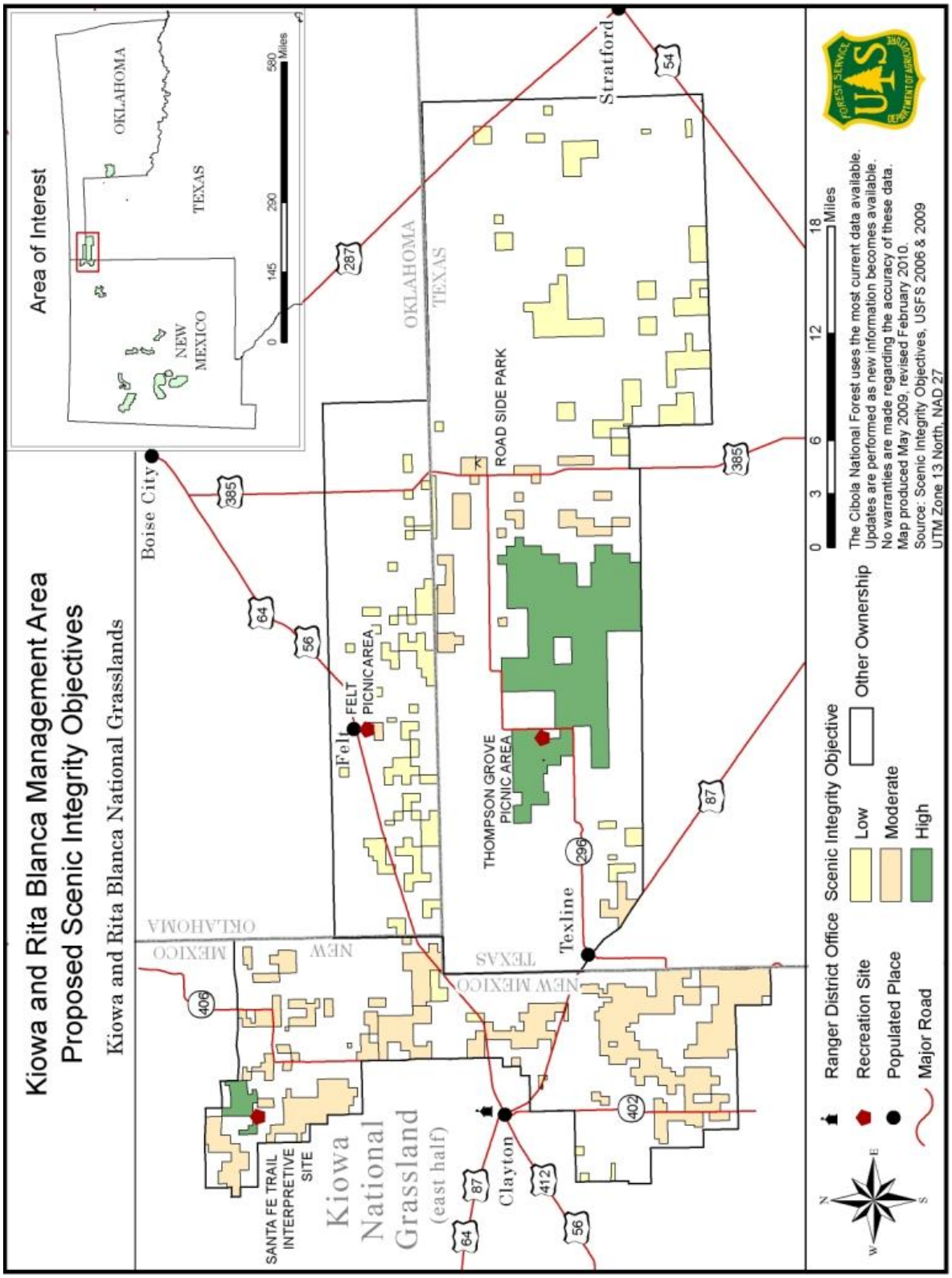
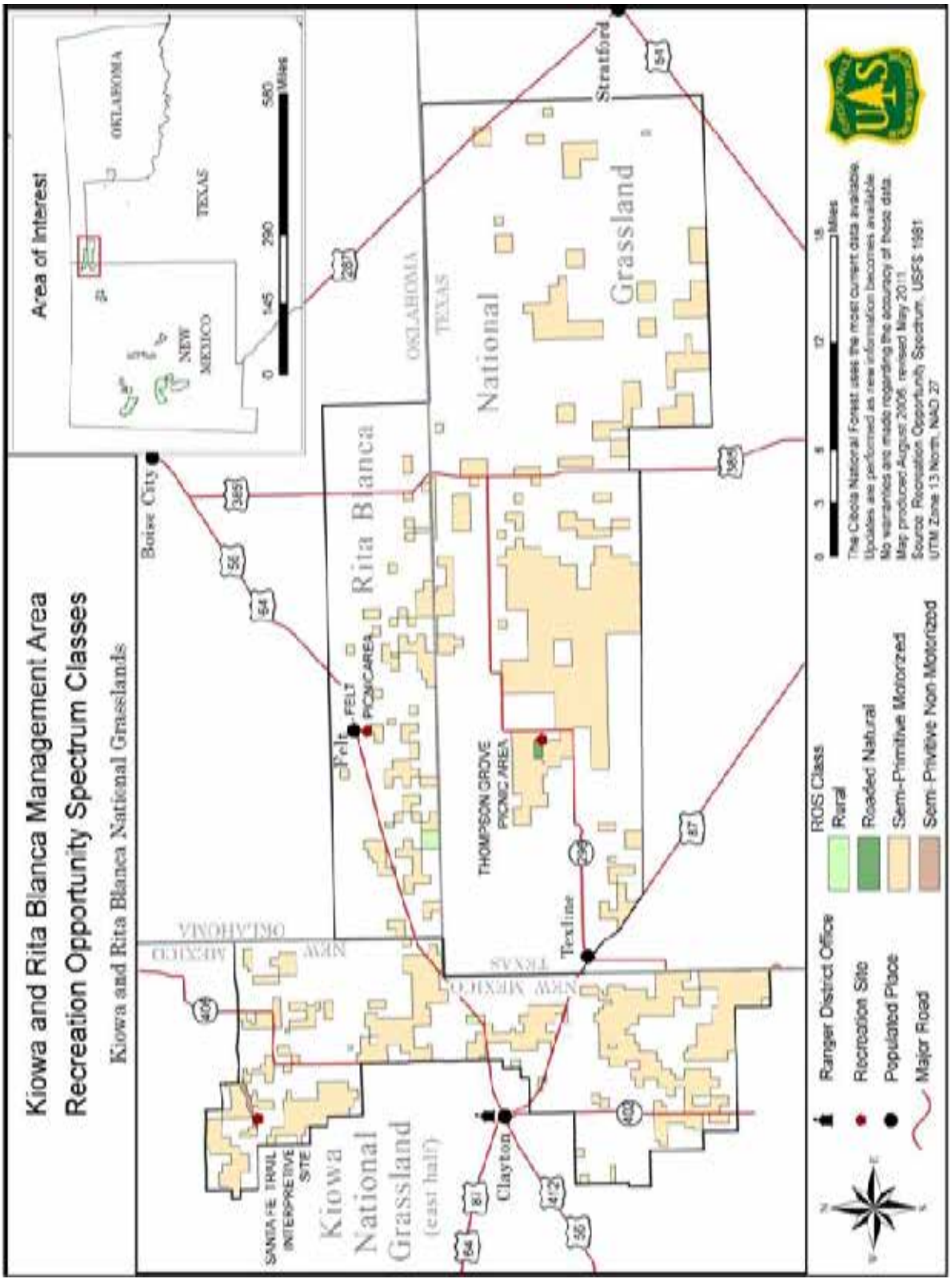
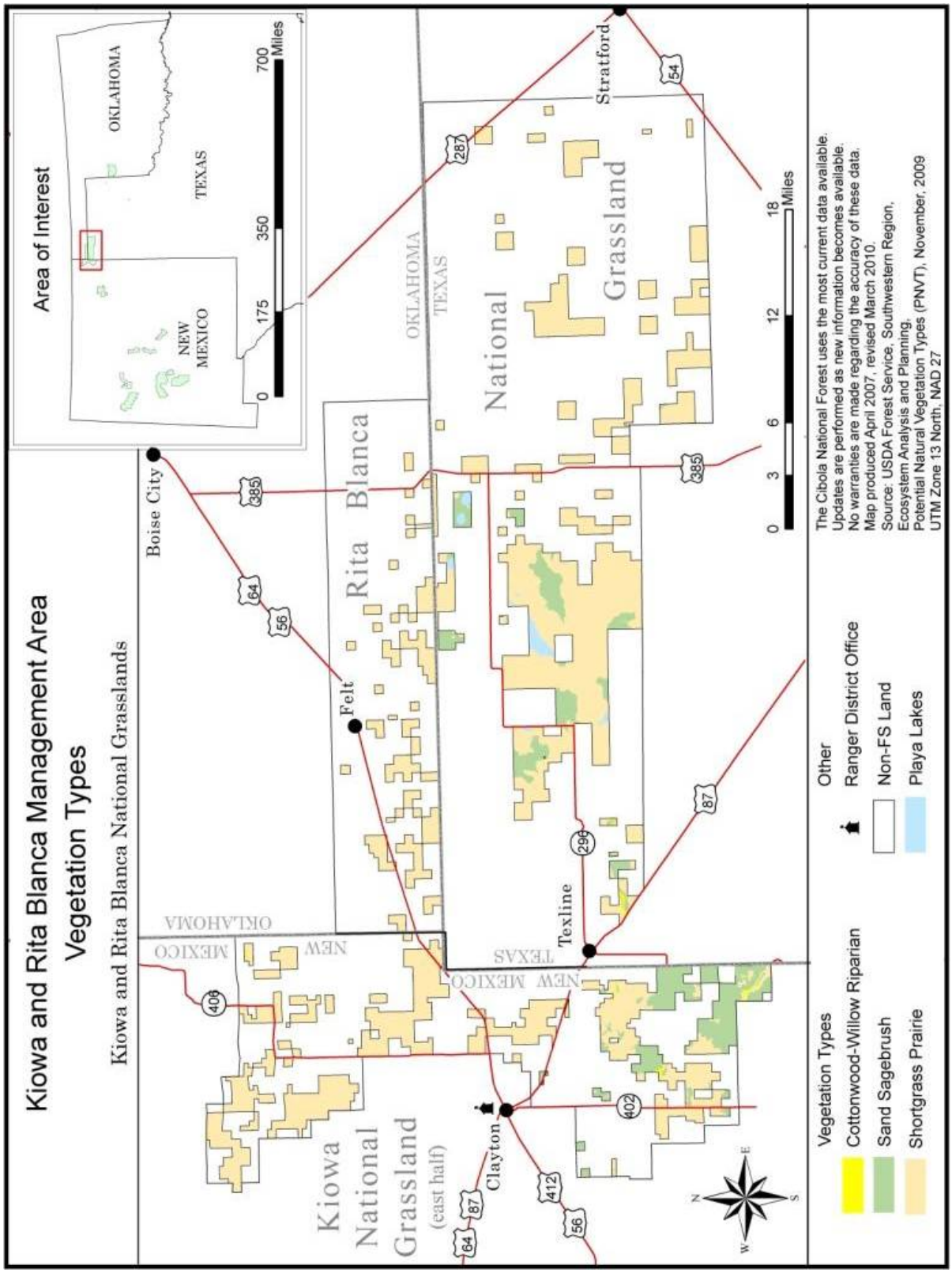
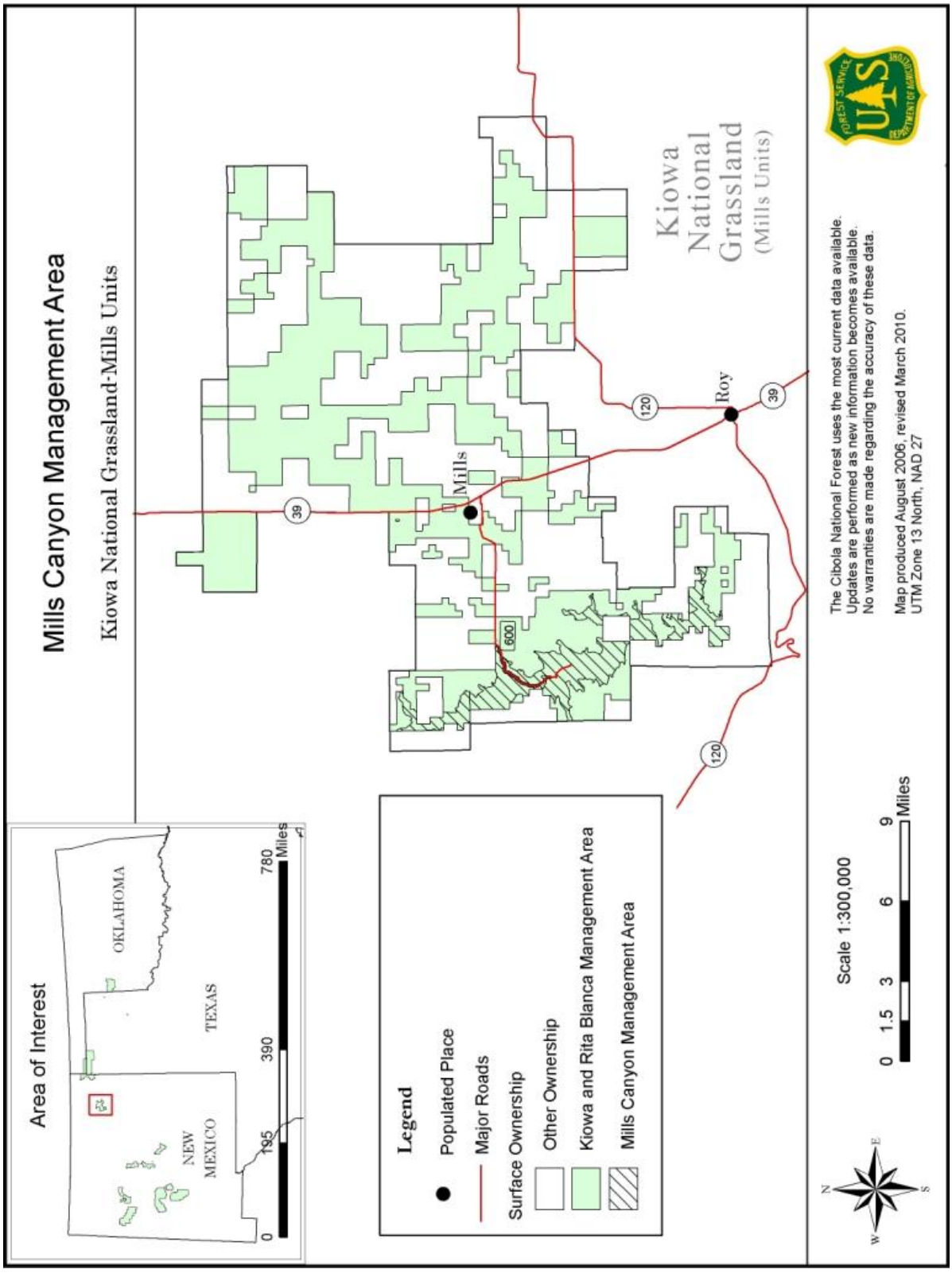
Potential Natural Vegetation Types (PNVT), June 2009
UTM Zone 14 North, NAD 27

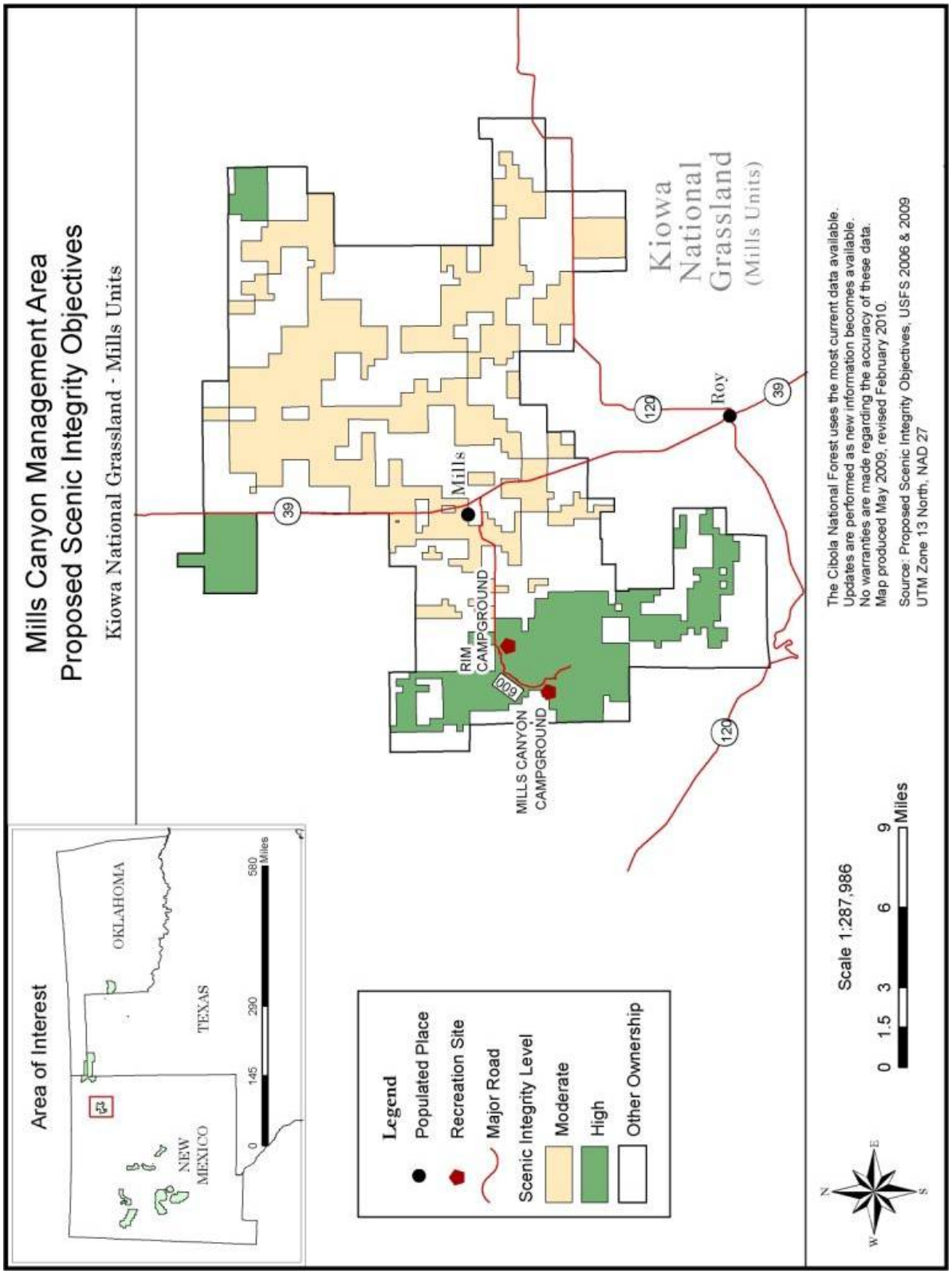

Kiowa and Rita Blanca Management Area
Kiowa and Rita Blanca National Grasslands
OKLAHOMA
TEXAS
NEW MEXICO
Stratford
Boise City
Felt
Texline
Clayton
Kiowa National Grassland (East Half)
Rita Blanca National Grassland
Kiowa National Grassland (Mills Units)
Mills
Roy
287
385
406
402
298
39
120
Legend
Populated Place
Ranger District Office
Major Roads
Other Ownership
Kiowa and Rita Blanca Management Area
Mills Canyon Management Area
Area of Interest
OKLAHOMA
TEXAS
NEW MEXICO
0 175 350 700 1,050 Miles
Scale 1:937,160
0 2.5 5 10 15 Miles
N
E
S
W
The Cibola National Forest uses the most current data available.
Updates are performed as new information becomes available.
No warranties are made regarding the accuracy of these data.
Map produced March 2010.
UTM Zone 13 North, NAD 27

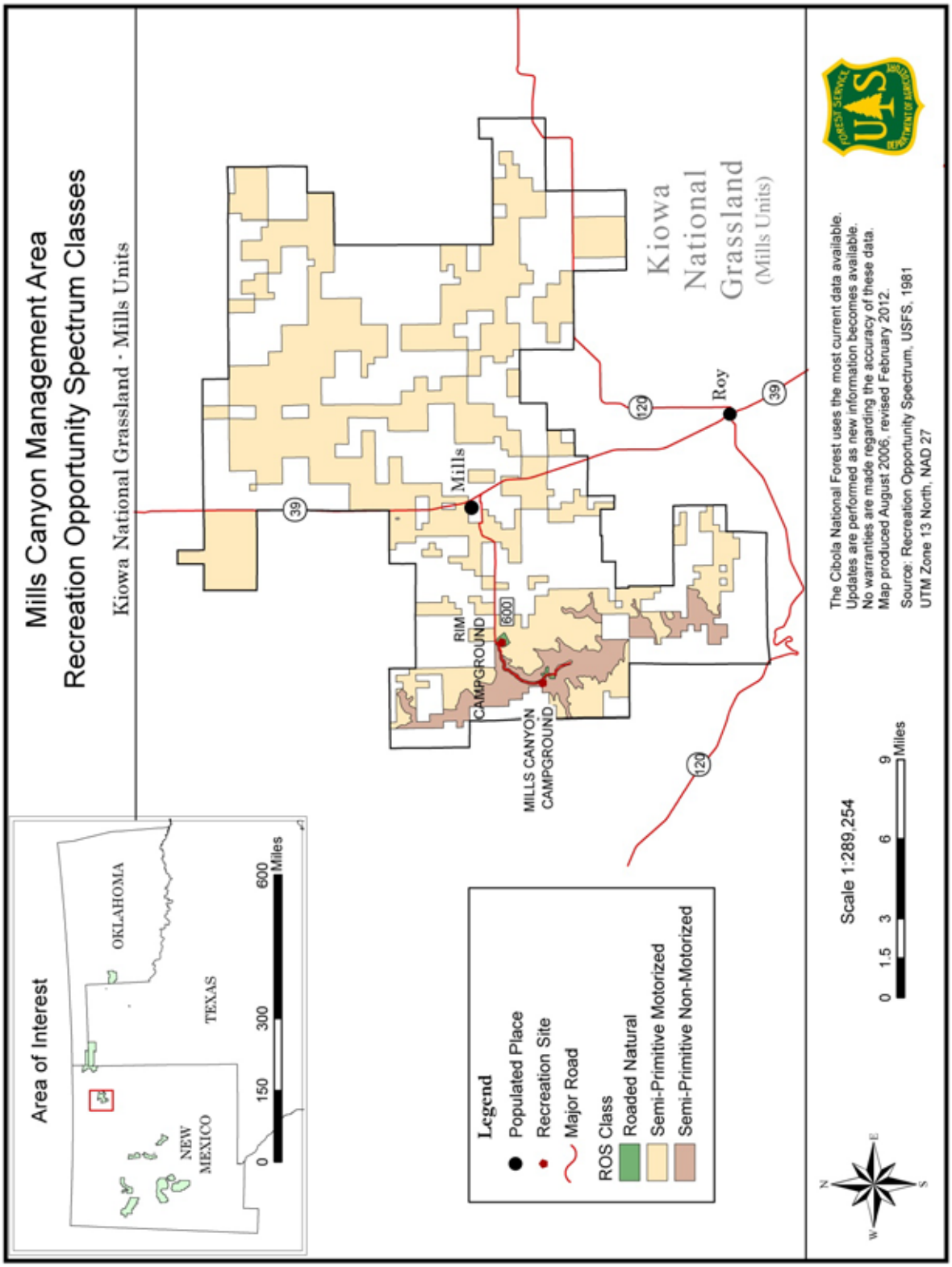

Kiowa and Rita Blanca Management Area
Proposed Scenic Integrity Objectives
Kiowa and Rita Blanca National Grasslands
Area of Interest
OKLAHOMA
TEXAS
NEW MEXICO
0 145 290 580 Miles
Boise City
Stratford
Felt
Texline
Clayton
FELT PICNIC AREA
THOMPSON GROVE PICNIC AREA
ROAD SIDE PARK
SANTA FE TRAIL INTERPRETIVE SITE
Kiowa National Grassland (east half)
OKLAHOMA
TEXAS
NEW MEXICO
Ranger District Office
Recreation Site
Populated Place
Major Road
Scenic Integrity Objective
Low
Moderate
High
Other Ownership
0 3 6 12 18 Miles
The Cibola National Forest uses the most current data available.
Updates are performed as new information becomes available.
No warranties are made regarding the accuracy of these data.
Map produced May 2009, revised February 2010.
Source: Scenic Integrity Objectives, USFS 2006 & 2009
UTM Zone 13 North, NAD 27

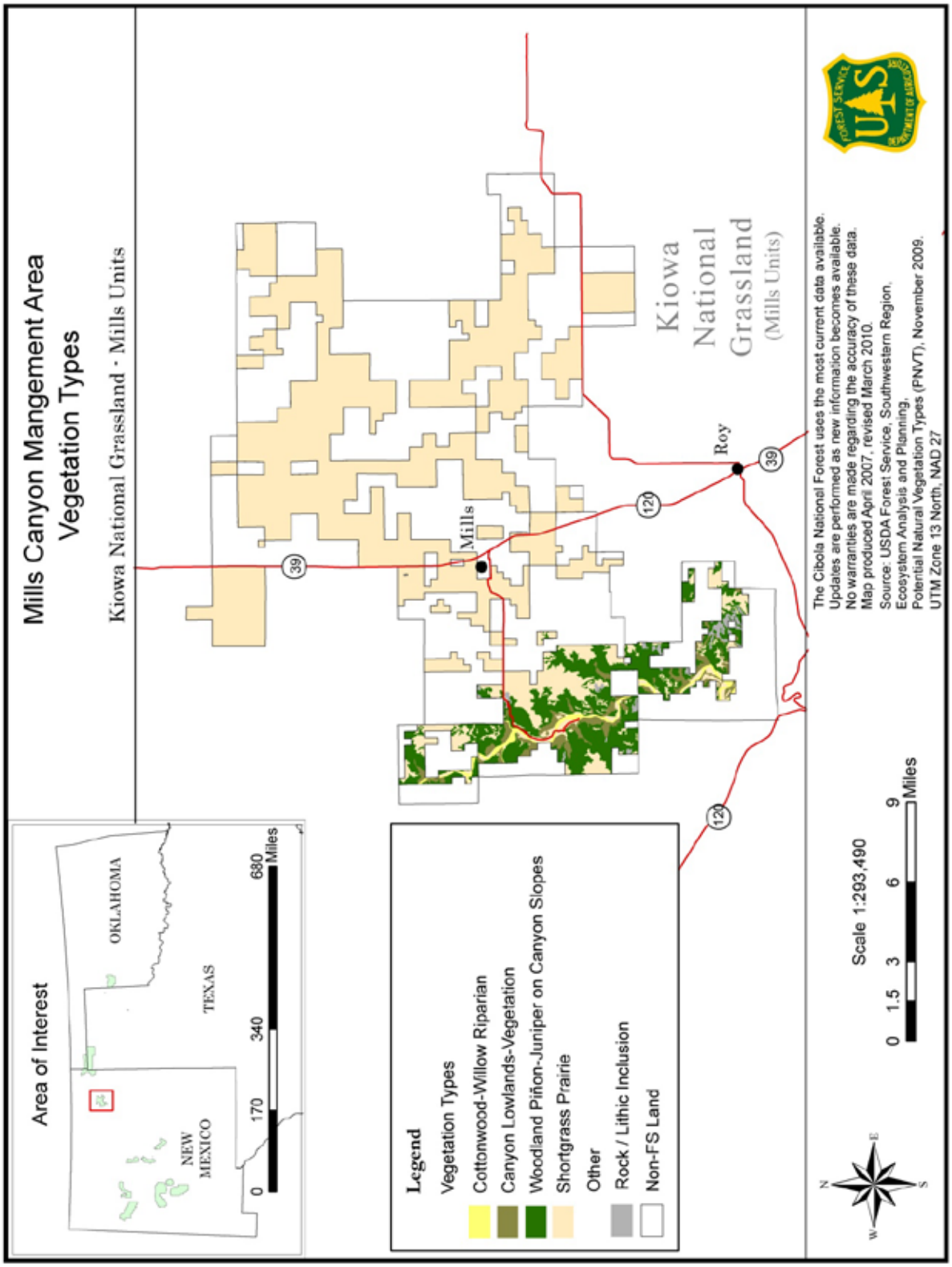

Kiowa and Rita Blanca Management Area
Recreation Opportunity Spectrum Classes
Kiowa and Rita Blanca National Grasslands
Area of Interest
OKLAHOMA
TEXAS
NEW MEXICO
0 145 290 580 Miles
Boise City
Stratford
Rita Blanca
National
Grassland
Felt
FELT PICNIC AREA
THOMPSON GROVE PICNIC AREA
Texline
Clayton
Kiowa National Grassland (east half)
SANTA FE TRAIL INTERPRETIVE SITE
ROS Class
Rural
Roaded Natural
Semi-Primitive Motorized
Semi-Primitive Non Motorized
Ranger District Office
Recreation Site
Populated Place
Major Road
0 3 6 12 18 Miles
The Cibola National Forest uses the most current data available. Updates are performed as new information becomes available. No warranties are made regarding the accuracy of these data. Map produced August 2006, revised May 2011.
Source: Recreation Opportunity Spectrum, USFS 1981
UTM Zone 13 Norm, NAD 27

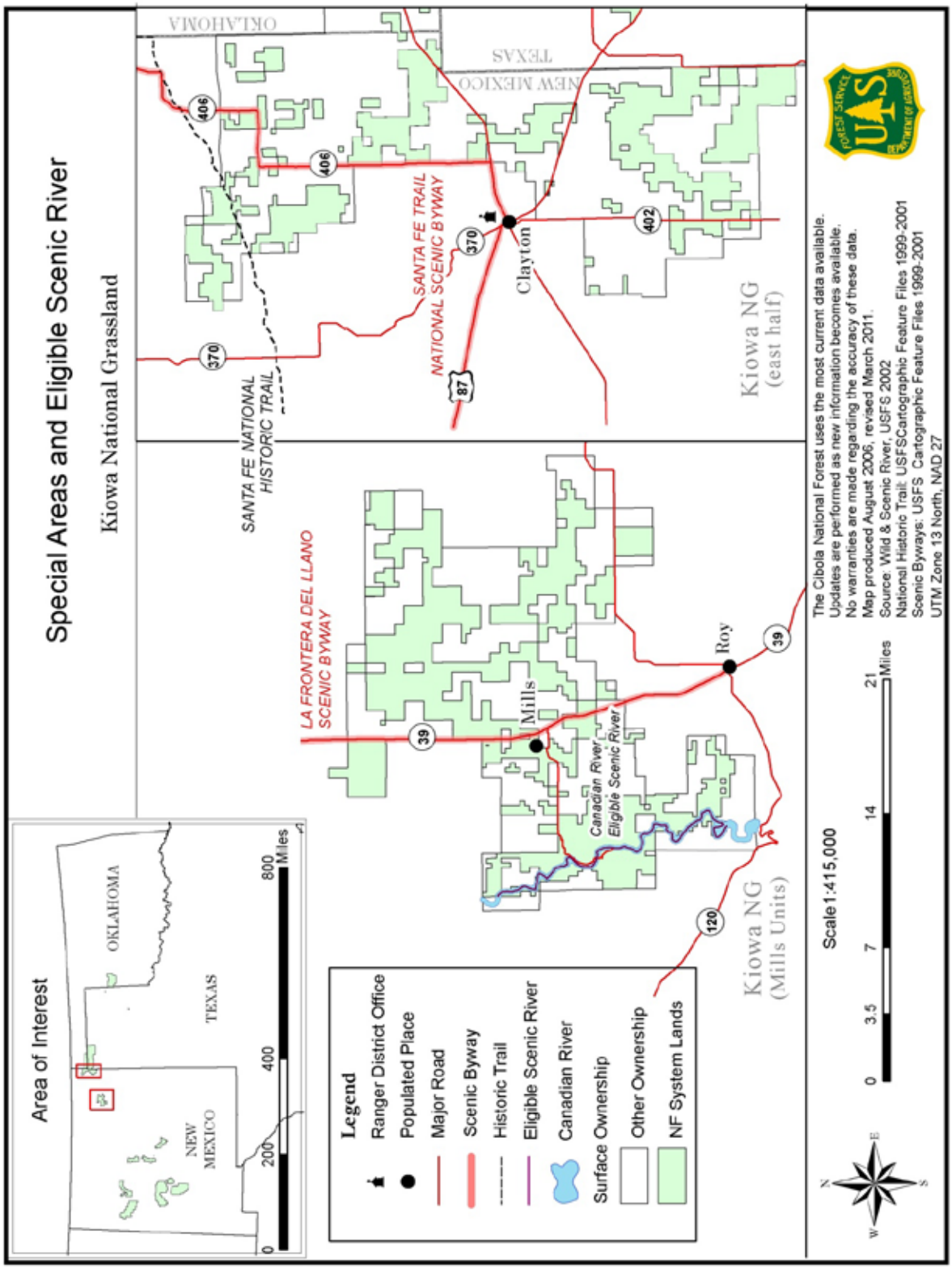

Kiowa and Rita Blanca Management Area
Vegetation Types
Kiowa and Rita Blanca National Grasslands
Area of Interest
OKLAHOMA
TEXAS
NEW MEXICO
0
175
350
700
Miles
Boise City
Felt
Texline
Clayton
Stratford
Rita Blanca
National Grassland
Kiowa National Grassland (east half)
OKLAHOMA
TEXAS
NEW MEXICO
385
64
56
287
54
87
412
402
406
0
3
6
12
18
Miles
The Cibola National Forest uses the most current data available.
Updates are performed as new information becomes available.
No warranties are made regarding the accuracy of these data.
Map produced April 2007, revised March 2010.
Source: USDA Forest Service, Southwestern Region,
Ecosystem Analysis and Planning.
Potential Natural Vegetation Types (PNVT), November, 2009
UTM Zone 13 North, NAD 27
Other
Ranger District Office
Non-FS Land
Playa Lakes
Vegetation Types
Cottonwood-Willow Riparian
Sand Sagebrush
Shortgrass Prairie
N
S
E
W

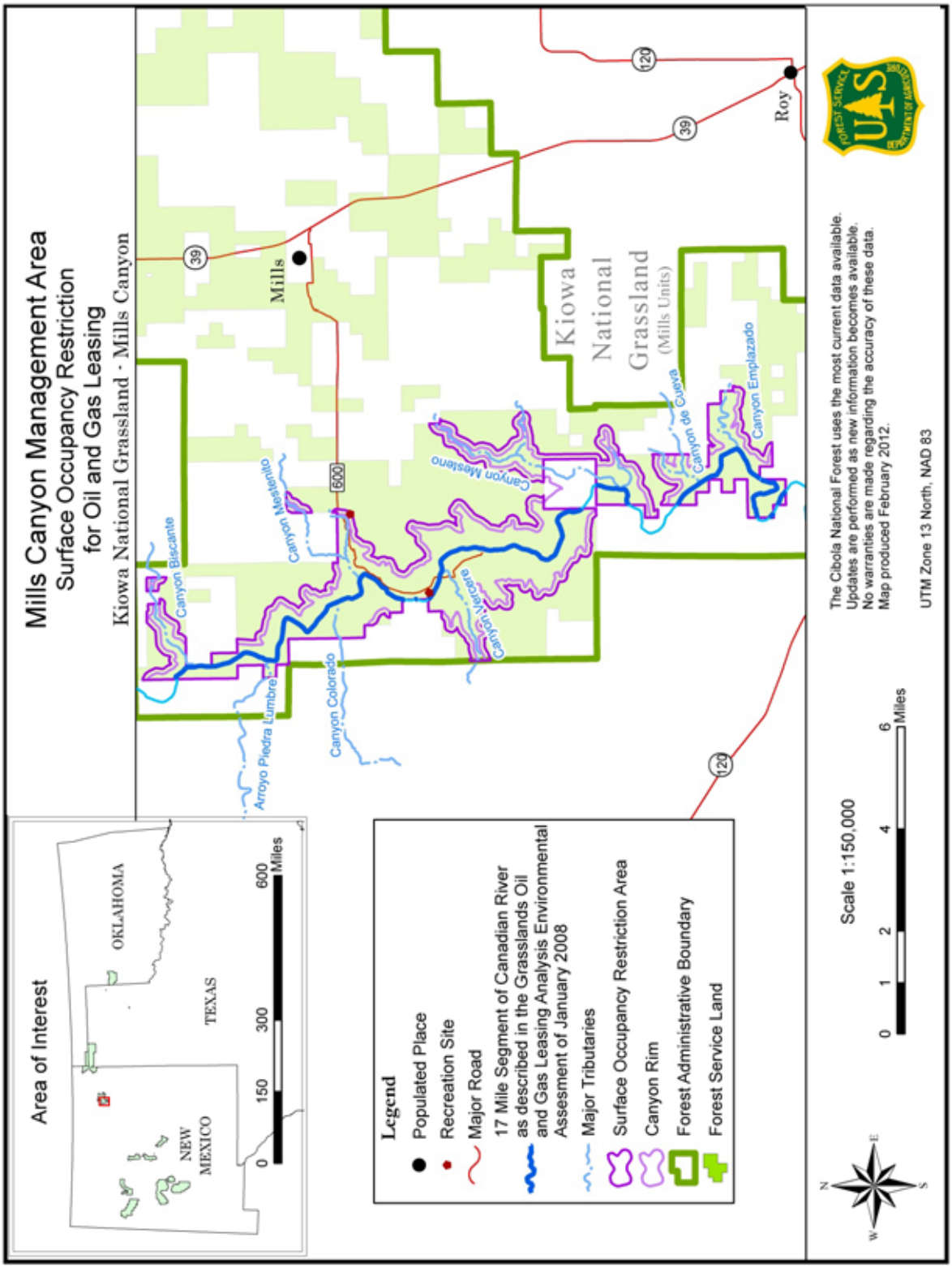

Mills Canyon Management Area
Kiowa National Grassland-Mills Units
Kiowa National Grassland (Mills Units)
Mills
Roy
39
120
600
Area of Interest
OKLAHOMA
TEXAS
NEW MEXICO
0
195
390
780
Miles
Legend
Populated Place
Major Roads
Surface Ownership
Other Ownership
Kiowa and Rita Blanca Management Area
Mills Canyon Management Area
Scale 1:300,000
0 1.5 3 6 9
Miles
N
E
S
W
The Cibola National Forest uses the most current data available.
Updates are performed as new information becomes available.
No warranties are made regarding the accuracy of these data.
Map produced August 2006, revised March 2010.
UTM Zone 13 North, NAD 27


Mills Canyon Management Area
Proposed Scenic Integrity Objectives
Kiowa National Grassland - Mills Units
Kiowa National Grassland (Mills Units)
Mills
Roy
RIM CAMPGROUND
MILLS CANYON CAMPGROUND
009
39
120
129
Area of Interest
OKLAHOMA
TEXAS
NEW MEXICO
0 145 290 580 Miles
Legend
Populated Place
Recreation Site
Major Road
Scenic Integrity Level
Moderate
High
Other Ownership
Scale 1:287,986
0 1.5 3 6 9 Miles
N E S W
The Cibola National Forest uses the most current data available.
Updates are performed as new information becomes available.
No warranties are made regarding the accuracy of these data.
Map produced May 2009, revised February 2010.
Source: Proposed Scenic Integrity Objectives, USFS 2006 & 2009
UTM Zone 13 North, NAD 27


Mills Canyon Management Area
Recreation Opportunity Spectrum Classes
Kiowa National Grassland - Mills Units
Kiowa National Grassland (Mills Units)
Mills
Roy
RIM CAMPGROUND
MILLS CANYON CAMPGROUND
600
39
120
Area of Interest
OKLAHOMA
TEXAS
NEW MEXICO
0 150 300 600 Miles
Legend
Populated Place
Recreation Site
Major Road
ROS Class
Roaded Natural
Semi-Primitive Motorized
Semi-Primitive Non-Motorized
Scale 1:289,254
0 1.5 3 6 9 Miles
The Cibola National Forest uses the most current data available.
Updates are performed as new information becomes available.
No warranties are made regarding the accuracy of these data.
Map produced August 2006, revised February 2012.
Source: Recreation Opportunity Spectrum, USFS, 1981
UTM Zone 13 North, NAD 27


Mills Canyon Mangement Area
Vegetation Types
Kiowa National Grassland - Mills Units
Kiowa
National
Grassland
(Mills Units)
Mills
Roy
39
120
Area of Interest
OKLAHOMA
TEXAS
NEW
MEXICO
0 170 340 680 Miles
Legend
Vegetation Types
Cottonwood-Willow Riparian
Canyon Lowlands-Vegetation
Woodland Piñon-Juniper on Canyon Slopes
Shortgrass Prairie
Other
Rock / Lithic Inclusion
Non-FS Land
Scale 1:293,490
0 1.5 3 6 9 Miles
N
E
S
W
The Cibola National Forest uses the most current data available.
Updates are performed as new information becomes available.
No warranties are made regarding the accuracy of these data.
Map produced April 2007, revised March 2010.
Source: USDA Forest Service, Southwestern Region,
Ecosystem Analysis and Planning,
Potential Natural Vegetation Types (PNVT), November 2009.
UTM Zone 13 North, NAD 27


Special Areas and Eligible Scenic River
Kiowa National Grassland
Area of Interest
OKLAHOMA
TEXAS
NEW MEXICO
0
200
400
800
Miles
Legend
Ranger District Office
Populated Place
Major Road
Scenic Byway
Historic Trail
Eligible Scenic River
Canadian River
Surface Ownership
Other Ownership
NF System Lands
SANTA FE NATIONAL HISTORIC TRAIL
SANTA FE TRAIL NATIONAL SCENIC BYWAY
LA FRONTERA DEL LLANO SCENIC BYWAY
Clayton
Mills
Roy
Canadian River Eligible Scenic River
Kiowa NG (east half)
Kiowa NG (Mills Units)
406
370
87
402
39
120
Scale 1:415,000
0
3.5
7
14
21
Miles
The Cibola National Forest uses the most current data available.
Updates are performed as new information becomes available.
No warranties are made regarding the accuracy of these data.
Map produced August 2006, revised March 2011.
Source: Wild & Scenic River, USFS 2002
National Historic Trail: USFSCartographic Feature Files 1999-2001
Scenic Byways: USFS Cartographic Feature Files 1999-2001
UTM Zone 13 North, NAD 27


Mills Canyon Management Area
Surface Occupancy Restriction
for Oil and Gas Leasing
Kiowa National Grassland - Mills Canyon
Area of Interest
OKLAHOMA
TEXAS
NEW MEXICO
0 150 300 600 Miles
Legend
Populated Place
Recreation Site
Major Road
17 Mile Segment of Canadian River as described in the Grasslands Oil and Gas Leasing Analysis Environmental Assesment of January 2008
Major Tributaries
Surface Occupancy Restriction Area
Canyon Rim
Forest Administrative Boundary
Forest Service Land
Mills
Roy
Kiowa National Grassland (Mills Units)
Canyon Bisciante
Canyon Mesteno
Canyon Colorado
Arroyo Piedra Lumbre
Canyon Mesteno
Canyon de Cueva
Canyon Emplazado
600
39
120
Scale 1:150,000
0 1 2 4 6 Miles
The Cibola National Forest uses the most current data available. Updates are performed as new information becomes available. No warranties are made regarding the accuracy of these data. Map produced February 2012.
UTM Zone 13 North, NAD 83

# Appendix M. Correspondence with the U.S. Fish and Wildlife Service and Biological Assessment

USDA United States Department of Agriculture | Forest Service | Southwestern Region Regional Office | 333 Broadway SE Albuquerque, NM 87102 FAX (505) 842-3800 V/TTY (505) 842-3292

File Code: 2670
Date: MAY 31 2012

Dr. Benjamin Tuggle
Regional Director, Southwest Region
U.S. Fish and Wildlife Service
500 Gold Ave.
P.O. Box 1306
Albuquerque, NM 87103-1306

Dear Dr. Tuggle:

In accordance with Section 7(a) 2 of the Endangered Species Act of 1973, as amended, the U.S. Forest Service Southwestern Regional Office (USFS), requests informal consultation and concurrence on the effects to threatened, endangered, and candidate species and critical habitat from the Preferred Alternative Programmatic Land and Resource Management Plan (LRMP), for the Kiowa (K), Rita Blanca (RB), Black Kettle (BK,) and McClellan Creek (MC) National Grasslands (NGs). The USFS is seeking concurrence with determinations of "may affect, not likely to adversely affect" for two species, the Interior Least Tern, Arkansas River shiner, and for Arkansas River shiner critical habitat. The USFS requests concurrence on a "No Jeopardy" determination for the LPC. Additionally, the USFS seeks concurrence with a determination of "may affect, not likely to adversely affect" for the candidate species Lesser Prairie-chicken (LPC). For other listed species or critical habitats that occur in the counties in which the NGs reside, but are not within the action area, we make a "No Effect" determination. All effects upon species and critical habitats where either a concurrence is requested, or where a "No effect" determination is made, are analyzed and documented in the enclosed Biological Assessment. The Preferred Alternative LRMP is provided for your reference on CDs (4).

The areas affected by the Preferred Alternative LRMP are the four NGs administered by the Cibola National Forest and Grasslands, and adjacent lands and waters. The K NG covers 137,537 acres and is located within Mora, Harding, Union, and Colfax Counties, NM. The RB NG covers 92,989 acres and is located within Dallam County, TX, and Cimarron County, OK. The BK NG covers 31,286 acres and is located within Roger Mills County, OK, and Hemphill Counties, TX. The MC NG covers 1,449 acres and is located in Gray County, TX.

Please address your concurrence to Corbin L. Newman, Jr., Regional Forester, at the address above. Contact Bobbi Barrera, U.S. Forest Service, Southwest Region Threatened, Endangered, and Sensitive Species Program Manager at (505) 842-3194, email blbarrera@fs.fed.us, or Champe Green, Cibola National Forest and Grasslands, Forest Planner at (505) 346-3889, email champegreen@fs.fed.us if you have any additional questions or need additional information.

Sincerely,

for CORBIN L. NEWMAN, JR.
Regional Forester

Enclosure

cc: Susan S Millsap, Matt Turner, Delfinia Montano, USFWS Southwest Regioncc: Susan S Millsap
Delfinia Montano, USFWS Southwest Region

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# Biological Assessment

## for

## Kiowa, Rita Blanca, Black Kettle, and McClellan Creek National Grasslands Land and Resource Management Plan

**LOCATION:**

Colfax, Harding, Mora, and Union Counties, New Mexico
Cimarron and Roger Mills Counties, Oklahoma
Dallam, Gray, and Hemphill Counties, Texas

May 2012

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# Introduction

The purpose of this Biological Assessment (BA) is to analyze the potential impacts of implementing the Proposed Programmatic Land and Resource Management Plan (Proposed Plan) for the Kiowa, Rita Blanca, (KRB) Black Kettle, (BK), and McClellan Creek, (MC), National Grasslands (NG) in sufficient detail to determine to what extent the Proposed Plan may affect any of the threatened, endangered, or candidate species listed below or their designated critical habitats (CH). This BA is prepared in accordance with legal requirements set forth under Section 7 of the Endangered Species Act (16 U.S.C. 1536 (c)), and follows the standards established in the Forest Service's NEPA and ESA guidance.

# Biological Assessment

## Objectives

### Analysis Approach

The objectives of this BA are to

1. Analyze the potential impacts of the Desired Conditions, Objectives, Standards, and Guidelines in the Proposed KRB, BK, and MC NG Land and Resource Management Plan that may affect federally listed, proposed, and candidate species and designated or proposed critical habitats, and

2. Determine the potential effects of the programmatic direction described in the Proposed Plan on federally listed, proposed, and candidate species, and proposed or designated critical habitats.

## Species Addressed

All federally listed, proposed, and candidate species and designated and proposed critical habitats in the action area were identified and accepted in correspondence between the U. S. Fish and Wildlife Service (USFWS) Regional Office and the Forest Service (personal communication, email from Delfinia Montano to Bobbi L Barrera, May 8, 2012).

In this BA, candidate species will be treated as if they are proposed for listing. Therefore, a **Jeopardy or No Jeopardy** determination will be made, and a **"no effect", "may effect", "not likely to adversely affect" or "likely to adversely affect"** will also be made. There is no designated Critical Habitat (CH) for listed species in the action area. The Federally listed and candidate wildlife and fish species this BA discussed include 4 endangered, 3 threatened species, 1candidate species, and 4 designated CHs:

1. Southwestern Willow Flycatcher (SWF) (*Empidonax traillii extimus*) Endangered with designated critical habitat

2. Black-footed ferret (BFF) (*Mustela nigripes*) Endangered

3. Interior Least Tern (*Sterna antillarum*) Endangered

4. Whooping Crane (*Grus Americana*) Endangered

5. Mexican Spotted Owl (MSO) (*Strix occidentalis lucida*) Threatened with designated critical habitat
6. Piping Plover (*Charadrius melodus*) Threatened with designated critical habitat
7. Arkansas River shiner (*Notropis girardi*) Threatened with designated critical habitat
8. Lesser Prairie-chicken (*Tympanuchus pallidicintus*) Candidate

## Critical Habitat

Final ruling on CH for the MSO was established by USFWS August 31, 2004. Final ruling on CH for the SWF was established by USFWS October 19, 2005. Final ruling on CH for Arkansas River shiner was established by USFWS in 2001. Final ruling on CH for Piping Plover was established on May 3, 2001.

## Consultation History

During planning process that led up to the Proposed Plan, collaboration and consultation with the USFWS was ongoing and occurred at meetings and through correspondence.

- On July 19th 2006, Grasslands biologists met in Cheyenne, OK with Oklahoma Ecological Services, (ES) USFWS biologist and Oklahoma Department of Wildlife Conservation representatives to determine occurrence of listed species on the Grasslands and habitat concerns.
- On July 20th 2006, Grasslands biologists met in Amarillo, TX with Texas ES USFWS biologist and Texas Parks and Wildlife representatives to determine occurrence of listed species on the Grasslands and habitat concerns.
- On March 5th 2008, Grasslands biologists met in Cheyenne, OK with Oklahoma ES USFWS biologist and Oklahoma Department of Wildlife Conservation representatives to evaluate listed species for viability risks on the Grasslands.
- On March 17th 2008, Grasslands biologists met in Amarillo, TX with Texas ES USFWS biologist and Texas Parks and Wildlife representatives to evaluate listed species for viability risks on the Grasslands.
- On July 14th 2010, Grasslands biologists met in Lubbock, TX with the Texas and New Mexico ES USFWS biologist and Texas Parks and Wildlife representatives to conduct management indicator species evaluation and selection for assessing Grasslands Plan Alternatives.
- On July 15th 2010, Grasslands biologists met in Cheyenne, OK with Oklahoma ES USFWS biologist and Oklahoma Department of Wildlife Conservation representatives to conduct management indicator species evaluation and selection for assessing Grasslands Plan Alternatives.
- On April 17th, 2009, the United States Forest Service (USFS) requested re-initiation of the USFS Southwest Region 2005 Land Resource Management Plans BO/CO. Again, on May 18th, 2010, the USFS requested re-initiation for all species addressed in the 2005 Land Resource Management Plan BO/CO, as well as requesting consultation for the

ocelot, a species now considered present in small numbers in Arizona. The USFWS acknowledged the requests for re-initiation for the MSO on June 22nd, 2010, and followed up with a clarification letter acknowledging the USFS request to reinitiate consultation for all other species, including the ocelot, on August 9th, 2010. On October 18th, 2010 the USFS submitted a species list for this re-initiation effort to the USFWS for concurrence On January 18th, 2011 the USFS received a species list concurrence letter from the USFWS (Biological Assessment for Re-initiation of Consultation on the Continued Implementation of the Land and Resource Management Plans for the Eleven National Forests and National Grasslands of the Southwestern Region, USDA Forest Service, April 6, 2011).

- In May, 2012, an email of concurrence for the species to be considered for ESA section 7(a) (2) consultation was received from the USFWS Region 2 Regional Office section 7 coordinator.

## Current Management Direction

The management of the Grasslands has been directed by the 1985 Cibola National Forest Land and Resource Management Plan (1985 Plan), which combined the management direction for the Grasslands with the forested, mountain districts of the Cibola National Forest. When the Record of Decision is signed by the Regional Forester, the new Grasslands Proposed Plan will replace the direction of the 1985 Plan for just the Grasslands administered by the Cibola NF.

## Description of the Proposed Action

### Grasslands Programmatic Land and Resource Management Plan

The National Forest Management Act of 1976 (NFMA) requires that land and resource management plans are to be revised on a 10 to 15-year cycle. The Cibola National Forest and National Grasslands is using the guidance of the 2012 Planning Rule transition language allowing use of the provisions of the 1982 Planning Rule, including the requirement to prepare an EIS, to complete the new plan for the Grasslands.

Under the authority of Bankhead-Jones Farm Tenant Act of 1937 and The National Forest Management Act of 1976, the actions of long-range management strategies for the Kiowa, Rita Blanca, Black Kettle, and McClellan Creek National Grasslands will be authorized by the USDA Forest Service Regional Forester of the Southwestern Region, located at 333 Broadway Blvd., SE Albuquerque, NM 87102. The management strategies provide a strategic–outcome oriented–programmatic framework for future activities and will be implemented at the District level through the application of certain Desired Conditions, Objectives, Standards, and Guidelines.

Land and Resource Management Plans do not, however, make site-specific decisions about exactly how, when, and where these activities will be carried out. But, all site-specific activities must conform to the programmatic framework set up in the Plans, and they must meet site-specific NEPA and ESA requirements. This consultation on the programmatic direction of the Proposed Plan does not eliminate the requirement for project-specific biological analyses and the possible need for site-specific informal or formal ESA § 7 (a) (2) consultation with the USFWS.

The USFS analyzed the effects of the Proposed Plan and desired conditions on the listed and candidate species in the action area. However, the USFS recognizes that the potential exists,

although unlikely, that adverse effects may be identified during the implementation of site-specific activities in the action area. The USFS believes that if this does occur in the future, it should not necessarily trigger a re-initiation of ESA consultation on the Proposed Plan.

The proposed action being analyzed in this BA is the programmatic direction for the National Grasslands as described through Desired Conditions, Objectives, Standards, and Guidelines that direct how current and future activities will be carried out in the following topic or resource areas:

- Developed Recreation
- Dispersed Recreation
- Heritage Resources
- Roads and Access
- Land Adjustment
- Mineral and Energy
- Special Uses
- Wind Energy
- Livestock Use
- Wildland Urban Interface/Fire Management
- General Ecological
- Wildlife Habitat Improvements
- Watersheds
- Soil, Water and Air
- Vegetation
- Noxious and Invasive Plants and Animals
- Forest Products
- Special Areas

Appendix A of this document, Plan Components Numerical Code Resource/Species/Category Listing, is a table of plan components in resource areas that were considered in the analysis for effects to T&E and candidate species in the action area of the Proposed Plan. The Desired Conditions, Objectives, Standards, and Guidelines related to some of the resource areas listed above are discussed in detail in the Species Assessment for which the USFS Seeks Concurrence section of this BA.

### Planning Process

In the summer of 2006, the Forest Service announced the initiation of the revision process of the Grasslands portion of the 1985 Plan. An Analysis of the Management Situation (AMS) was initiated for the Kiowa, Rita Blanca, Black Kettle, and McClellan Creek National Grasslands that provided the basis for the "needs for change" in the 1985 Plan direction. Numerous public information meetings were held in communities in northeastern New Mexico, the Texas panhandle, and western Oklahoma to inform and gather input from the public regarding the need to change the current plan to address the Grasslands specifically. Input from the public meetings and evaluation by the Forest Service of the social and economic and ecological sustainability of the Grasslands set the stage for developing this new plan.

The needs for change were synthesized into a set of key, integrated themes, or needs, as shown below.

**Include more adaptive management approaches:** Invasive species, climate change, and wildland fire are three pressing emerging issues faced by all land managers. These dynamic and complex issues and others that will surely come in future years, combined with other factors that are not easily predicted, point to the need for management strategies that allow for decision making processes that incorporate new and emerging information.

**Better address the unique, local conditions of the Grasslands:** The ecological, social, and economic conditions found in the Grasslands are highly unique. However, the current plan includes little or no direction that speaks to these unique conditions of the Grasslands. The Grasslands contain unique local features and opportunities that call for specialized assessments and management strategies.

**Address recreational opportunities and challenges:** The Grasslands contain many recreational opportunities that are not addressed in the current plan. It is expected that interest in recreation on the Grasslands will shift over time; therefore, there is a need to develop clear recreational management objectives and strategies.

**Better define short and long-term energy development objectives:** Oil and gas development on the Grasslands is important to support the Nation's energy needs and the local and regional economies of the Grasslands. However, as the energy needs of the Nation shift towards more sustainable resources and oil and gas productivity on some parts of the Grasslands decreases, there is a need to provide management direction for alternative energy development on the Grasslands. Moreover, there is a need to provide direction for the sustainable management of the fuelwood/biomass and firewood products found on the Grasslands that are important to the local economy.

## Summary of the Analysis of Management Situation: Ecological Need for Change

### Background

Since the 1985 Plan was implemented, ecological monitoring and new scientific information have advanced the Agency's knowledge and understanding of vegetation and its range of historical variation, ecological processes, and habitat requirements of native fauna. Similarly, new issues have emerged including the introduction of nonnative plants and changes in climate. Specific management direction is needed for the following:

- To move vegetation types toward desired vegetation structure and species composition
- To address the unwelcome introduction and spread of invasive species
- To anticipate and respond to changes in climate, relative to NG management

The determination of ecological sustainability and species viability on the Grasslands is a culmination of assessing ecosystem characteristics (including vegetation type, soil, water, and air) departure from the reference condition for determination and status of species diversity. The Ecological Sustainability Report (ESR) evaluated the ecological systems of the Kiowa, Rita Blanca, Black Kettle, and McClellan Creek National Grasslands and the relationship to the surrounding area (USDA Forest Service, 2011b). The ESR has two main sections—ecosystem diversity and species diversity. The ecosystem diversity section discusses conditions and trends in the vegetation communities and physical resources based on the historical reference condition of the vegetation types. Appendix F of the ESR supplements the information found in the Ecosystem

Diversity section of the ESR for the Grasslands. Specifically, it outlines the current and historical conditions for shortgrass prairie, pinyon-juniper, cottonwood-willow riparian, sand sagebrush, mixed grass prairie, shinnery oak, and mixed hardwood riparian vegetation types. The species diversity section looks at species found in Texas, New Mexico, and Oklahoma on the Grasslands and are affected by Grasslands management. Population or habitat concerns for the identified species were analyzed and viability risks determined.

### *Description of the Ecological Context*

The reference condition of vegetation structure was a primary factor used to determine ecological sustainability and to do the risk assessment for a species' viability. Reference condition represents an approximation of the vegetation structure when all historical ecological functions and processes were in place. A vegetation type is considered in low departure if it does not exceed 33 percent in departure from the reference condition for vegetation structure. All vegetation types on the grasslands are in low departure from reference condition for vegetation structure.

Most of the vegetation types on the Grasslands are under-represented or very under-represented on the Southern Great Plains. Four of the seven vegetation types found on the Grasslands have greater representation on the Grasslands relative to the surrounding landscape in shinnery oak, mixed hardwood riparian, cottonwood-willow, and sand sagebrush vegetation types. Mixed grass and shortgrass prairie have less representation on the Grasslands relative to the surrounding landscape; pinyon-juniper is equally represented.

The condition and trends in the Grasslands vegetation communities are evaluated on a 5- to 10-year interval using field reconnaissance, visual obstruction readings, Parker 3 Step transects (Ruyle & Dyess, 2010), cover-frequency transects, production clippings, photo points, and composition inventories. Data collected has been compared with historical data and with the Terrestrial Ecological Unit inventory.[1]

Mid-scale vegetation classification was used to place each vegetation type into a Successional Class Structure category based on the information in the historical condition reference model being used for the evaluation (Weisz et. al. 2009). A comparison was then made of the current percentage to the historical percentage for each successional class within the model. A departure index was calculated by the lesser of the two percentages (current vs. historical) subtracted from 100 for each successional class. The resulting number determined the level of departure.

- 0-33% = Low departure
- 34-66% = Moderately departed
- 67-100% = Severely departed

In addition to departure, vegetation trend was estimated by determining ecosystem attributes at risk. If current management activities are resulting in the ecosystem trending towards the reference condition, the attribute was determined not to be at risk.

[1] Terrestrial Ecosystem Unit inventory consists of mapping and interpreting ecosystems through a systematic examination, description, classification, and integration of the soil, vegetation, and climate on National Forest and Grasslands.

All of the vegetation types are within low departure from reference condition for vegetation structure, and continuation of management practices are expected to maintain that condition.

Some of the vegetation types, while in low departure from reference conditions for vegetation structure overall, may not be able to achieve their full historical extent. These include the shinnery oak areas that were once deeply plowed, as well as formerly cultivated old field sites in shortgrass prairie. The deep plowing practices on shinnery oak eliminated the species from some areas during the Dust Bowl era, and recovery does not readily occur. Some areas within the cottonwood-willow riparian may not have the capacity to fully recover to the lower percentages of departure from reference condition due to the disruption of natural hydrologic processes on and off of the Grasslands. While the structure and composition of the reference condition may not be fully achievable on some areas within the shinnery oak, shortgrass prairie, and the mixed hardwood riparian and cottonwood willow riparian vegetation types, the continuation of select management practices should maintain these areas within low departure.

Over the past several decades, watershed conditions have dramatically improved especially compared to the extremely degraded condition that occurred during the 1940s and 1950s following the Dust Bowl era. Conservation practices across the southern Great Plains, notably in the McClellan Creek drainage, have resulted in a substantial increase in infiltration and groundwater recharge and a subsequent reduction in surface runoff and associated sedimentation. Groundwater depletion is occurring, and although this is outside of Agency control, it has the potential to affect Grasslands management.

An animal and plant species viability assessment[2] was conducted by processing each species potentially occurring on the Grasslands through an assessment of various habitat and population factors and threats. Life history and population information was gleaned from the references used in the screening process and from National Grasslands biologists; States of Oklahoma, Texas, and New Mexico biologists; and the U.S. Fish and Wildlife Service biologists. The results of this process provided a numerical ranking of the risk to a species. Those species found to be at high risk were further assessed for their likelihood of being affected by the four population and distribution scenarios listed below:

- Widespread declines in population in the plan area and isolation of populations within the area
- Widespread population decline but without isolation of populations
- Localized population declines that may be accompanied by some minor restrictions in population interactions
- Populations and their distribution are unstable

Of the wildlife species identified as having viability concerns, Lesser Prairie-chicken, a candidate for Federal listing, was assessed to be at high risk.

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[2] "Fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired nonnative vertebrate species in the planning area. For planning purposes, a viable population shall be regarded as one which has the estimated numbers and distribution of reproductive individuals to insure its continued existence is well distributed in the planning area……. ." 36 CFR § 219.19 (1982)

### *Ecosystem Diversity*

The 1985 plan did not clearly and specifically address many of the concerns related to ecosystem restoration and maintenance specific to the Grasslands. The Proposed Plan provides direction that is more specific to the Grasslands in relation to ecosystem management, as follows:

- The vegetation types found on the National Grasslands are altered remnants of what were once found across the southern Great Plains. The Proposed Plan provides management direction that would maintain or accelerate movement of vegetation types toward lower departure from reference conditions, recognizing that past events may limit the ability to achieve full restoration in some vegetation types.
- There are invasive plants present on the National Grasslands that have the potential to affect ecosystem structure, composition, and processes. In addition, currently there are feral hogs that have the potential to negatively impact water resources, vegetation and wildlife habitat. The Proposed Plan will provide management direction addressing the introduction, spread, and control of invasive plants and animals.
- The Proposed Plan provides direction for anticipating and responding to changes in the climate, relative to National Grasslands management.
- During development of the Proposed Plan, a new set of Management Indicator Species (MIS) were selected to evaluate plan alternatives and to monitor the Proposed Plan when implemented. None of the MIS are listed as threatened, endangered, or candidate species.

### *Plan Components*

Plan components [goals/desired conditions (hereinafter referred to as desired conditions), objectives, suitability, guidelines, standards, monitoring, and special areas] are the guidance, direction, and decisions set forth by the plan to guide future projects. Non-plan components (e.g., Proposed and Probable Management Approaches; Appendix C of the Proposed Plan) are not guidance/direction, but rather our intent about how we might carry out (through collaboration, assessments, surveys, inventory, etc.) the guidance/direction encompassed within the plan components. Management approaches can describe the context, priorities, intent, risks and uncertainty, and expectations for future project consideration and implementation.

**Desired Conditions**

Desired conditions are statements of the social, economic, and ecological outcomes to be achieved in the future. These outcomes relate to land and resource conditions and ecological and social processes. They are aspirations and strategic in nature, rather than project-specific commitments. Some desired conditions may be achieved within the 15-year life of the plan, and others may extend beyond that time frame. Desired conditions strive to paint a picture of the future Grasslands so that every reader, be they manager or user, understands the same message. Desired conditions form the principal basis from which objectives are developed. Desired conditions ultimately serve to guide grassland managers in planning and providing direction for future actions and in developing a meaningful monitoring program to determine progress toward achievement over the life of the plan.

**Objectives**

Objectives are the proactive steps that the Grasslands expect to accomplish over the next 15 years to maintain or move toward the desired conditions of the plan. Objectives are measurable and

time-specific outcomes. Any project or activity undertaken during the life of the plan must be consistent with objectives.

Variations in achieving objectives may take place during the next 15 years because of changes in environmental conditions, available budgets, catastrophic events, and other unforeseen factors.

For some goods and services that a resource provides, there may not be proactive and measurable management activity that is necessary to maintain or move toward a desired condition; thus, not every desired condition has a related objective. In such cases where no objectives are explicitly stated, no unique or additive objectives exist for that desired condition. However, every stated objective does relate to one or more desired conditions within the respective resource, good or service, and geographic area.

Grasslands-wide objectives are applicable to the Kiowa, Rita Blanca, Black Kettle, and McClellan Creek National Grasslands. Those objectives applicable to a desired condition on one or more Grasslands, but not all, are so specified. The reader should note that when percentages are specified characterizing the areal extent of an objective, the percentage is intended to apply across the landscape and is not necessarily site-specific.

**Suitability**

Suitability describes the appropriateness of applying certain resource management practices to a particular area of land, as determined by an analysis of the economic and environmental consequences and the alternative uses foregone. A unit of land may be suitable for a variety of individual or combined management practices. Suitability doesn't guarantee approval or implementation of a project, and non-suitability doesn't unequivocally prohibit a project. If suitability is not determined, it is assumed the area is suitable for that resource use.

**Standards**

A Standard is an absolute requirement to be met in the design of projects and activities. A project or activity is consistent with a standard when its design is in accord with the explicit provisions of the standard; variance from a standard in any way is not allowed. Any project or activity that deviates from standards can only occur through plan amendments.

In summary, a project or activity may meet the spirit, if not the letter, of a guideline, but must meet the letter of a standard.

**Guidelines**

These criteria are applicable to project or activity design and execution on the Grasslands designed as sideboards for projects and activities to help achieve the desired conditions and objectives. In addition to guidelines and standards, Appendix D, of the Proposed Plan has other Sources of Information, Regulations, MOUs, Recovery Plan, and Forest Service directives and policy which further supply guidance for project development.

Guidelines contribute to maintaining or achieving desired conditions and objectives: they are specifications that a project or activity would adopt unless there is a compelling and defensible reason to vary from the guidelines. Such variances are only allowed without plan amendment if the alternative approach provided by the variance meets the intent of the plan guideline. If such a variance is considered appropriate, the responsible official, records in the project-level document, the reasons for that variance and no plan amendment is required. However, if the variance from the guideline deviates from the intent of the guideline, then a plan amendment is necessary to allow for that deviation. A project or activity must be consistent with guidelines or with the intent of the guidelines.

**Monitoring**

Plan direction on monitoring and evaluation will provide a basis for a periodic determination and evaluation of the effects of management practices. More specifically, monitoring and evaluation elements of the plan will reveal how well objectives have been met and how closely management guidelines and standards have been applied. Based on this evaluation, the Forest Supervisor may make changes in management direction or revisions or amendments to the Proposed Plan as are deemed necessary.

**Special Areas**

Special areas are lands within the National Forest System that have been designated by Congress or by administrative action by a responsible official within the USDA. These lands have unique or special characteristics. Examples relevant to the Grasslands include National and State Scenic Byways, a National Historic Trail, and an Eligible Scenic River.

## Action Area

**Location**

The area addressed by the Federal action in this BA is the four Grasslands administered by the Cibola National Forest and National Grasslands and those adjacent lands that may be indirectly affected by the proposed action.

The Kiowa National Grassland in New Mexico, Rita Blanca National Grassland, in Oklahoma and Texas Panhandle areas, Black Kettle National Grassland in Oklahoma and Texas, and McClellan Creek National Grassland in the Southeastern Panhandle of Texas (see Vicinity map in Maps section) have been under federal ownership since the late 1930s and are currently administered by the Cibola National Forest and National Grasslands Supervisor's Office located in Albuquerque, New Mexico.

The Kiowa NG covers 137,537 acres and is located within Mora, Harding, Union, and Colfax Counties, New Mexico. The Rita Blanca NG covers 92,989 acres and is located within Dallam County, Texas, and Cimarron County, Oklahoma. The district ranger office for both the Kiowa and Rita Blanca NGs is located in Clayton, New Mexico. The Black Kettle NG covers 31,286 acres and is located within Roger Mills County, Oklahoma, and Hemphill County, Texas. The McClellan Creek NG covers 1,449 acres and is located in Gray County, Texas. The district ranger office for both the BK and MC (BKMC) NGs is located in Cheyenne, Oklahoma.

**Background**

With the authorization of the Homestead Act in 1862, European settlement of the prairies took hold. During the following decades—through the 1920s—settlers could homestead a quarter section (160 acres) of unclaimed land. They established intensive wheat and row-crop agriculture, including cattle ranching, during a period of unusually wet weather. Beginning in the early 1930s, the region experienced severe drought, and strong winds swept across the exposed soils, removing as much as 4 inches of organic matter, clay, and silt, creating conditions that have come to be known as the Dust Bowl. With the farms ruined, thousands of families migrated westward, leaving vast tracts of land abandoned. In 1937, at the height of the Depression, Congress authorized the Bankhead Jones Farm Tenant Act requiring the Department of Agriculture to develop a program of land conservation and utilization.

In subsequent years, the USDA Soil Conservation Service purchased abandoned lands and initiated a number of projects intended to stabilize environmental conditions. Thus, over time the

160-acre parcels were assembled for reclamation. Some parcels collectively formed small contiguous units, but many remain dispersed and reflect the fragmented ownership pattern seen today. In 1960, with the establishment of the National Grasslands, responsibility for administration of the Bankhead Jones Act was transferred to the U.S. Forest Service.

On the grasslands, vegetation types occur across the landscape with variable elevation, landforms, soil depth, and erosion characteristics. These characteristics, along with management, determine vegetation structure, composition, habitat, and presence of associated species. Seven major vegetation types occur on the grasslands, together with some minor inclusions such as playa lakes, and unique habitat such as rivers and aquatic and riparian habitats.

The grasslands contribute to the sustainability of diverse southern Great Plains grassland ecosystems and associated wildlife and demonstrate successful ecosystem restoration of lands that were degraded during the Dust Bowl era. Grasslands management contributes to the sustainability of productive soils, high quality water and riparian resources, and native prairie habitat and species. The Grasslands units are not contiguous and are often isolated units among non-federal, privately held or State owned lands, making the habitat fragmented within the administrative boundaries.

## Species Accounts and Status of the Species in the Action Area

The following table lists the species identified by the USFWS that have Federal status and are listed in States and/or counties where the Grasslands have management activities.

**Table 1. Federally listed Threatened, Endangered, and candidate species, designated critical habitat and Grasslands Occurrence**

| Common Name | *Scientific Name* | Federal Status | Critical Habitat | Grasslands Occurrence |
|---|---|---|---|---|
| 1. Southwestern Willow Fycatcher | *Empidonax traillii extimus* | Endangered | Outside Distinct Population Segment (DPS) boundary. No CH in analysis Area | Does not occur on the Grasslands or adjacent lands |
| 2. Black-footed ferret | *Mustela nigripes* | Endangered | None designated | Extirpated |
| 3. Interior Least Tern | *Sterna antillarum* | Endangered | None designated | Foraging areas only |
| 4. Whooping Crane | *Grus americana* | Endangered | None designated | Does not occur on the Grasslands or adjacent lands |
| 5. Mexican Spotted Owl | *Strix occidentalis lucida* | Threatened | No CH in analysis Area | Does not occur on the Grasslands or adjacent lands |
| 6. Piping Plover | *Charadrius melodus* | Threatened | No CH in analysis Area | Does not occur on the Grasslands or adjacent lands |
| 7. Arkansas River shiner | *Notropis girardi* | Threatened | No CH in analysis Area | Does not occur on the Grasslands or adjacent lands |
| 8. Lesser Prairie-chicken | *Tympanuchus pallidicintus* | Candidate | None designated | No breeding population but may occur on BK |

**Species with "No Effect" Determination**

***Southwestern Willow Flycatcher***

The SWF breeds in dense riparian habitats in southwestern North America, and winters in southern Mexico, Central America, and northern South America. Species occurrence in Colfax and Mora Counties is part of the Upper Rio Grande Management Unit in New Mexico. The Action area is outside the Distinct Population Segment area for this species. There is no SWF designated or proposed CH on the Kiowa NG in Colfax and Mora Counties and the species does not occur on the Grasslands. There is **"No Effect"** to designated CH or to the species and it will not be considered further in this assessment.

***Black-footed ferret***

The black-footed ferret (BFF) depends almost exclusively on black-tailed prairie dog (BTPD) colonies for food, shelter, and denning. The range of the BFF coincides with that of BTPD's, and ferrets with young have been documented only in the vicinity of active BTPD colonies. The KRB NG are currently managing BTPD's to provide improved health of colonies through plague management, but existing colonies are not currently large enough to support a reintroduction of the BFF. If BFF reintroduction is deemed appropriate for the Rita Blanca (RB) NG, a separate NEPA document will be prepared for the reintroduction of ferrets. Since the BFF is extirpated from New Mexico, Texas, and Oklahoma (except for an experimental non-essential population well outside of the action area on Vermejo Ranch approximately 120 miles from the RB NG's border) there is **"No Effect"** to BFF and it will not be considered further in this assessment.

***Whooping Crane***

The Whooping Crane passes through the eastern panhandle of Texas each spring and fall during migration where they are sometimes sighted at stopover points along rivers, in grain fields, or in shallow wetlands. This species has never been observed on the MC NG in Gray County, Texas, and there are no suitable stopover habitats on the KRB NG in New Mexico and Texas. This species has never been observed at the Lake Marvin Unit in Hemphill County, Texas. The Whooping Crane passes through western Oklahoma each spring and fall during migration, and as in the eastern panhandle of Texas, are sometimes sighted at stopover points along rivers, in grain fields, or in shallow wetlands. This species has never been observed on the BK NG in Roger Mills County, Oklahoma. There is **"No Effect"** to the Whooping Crane and it will not be considered further in this assessment.

***Mexican Spotted Owl***

In general, Mexican Spotted Owl habitat consists of dense multistory stands of mixed conifer with a component of large trees, often old remnants in younger stands or mature or over mature stands. Spotted owls also prefer shaded, cool, moist canyon sites and mountain slopes with rock outcrops, cliffs, talus, and standing dead and down woody material. Neither the species nor CH occurs within the Grasslands districts or the action area for the proposed plan. There is **"No Effect"** to the Mexican Spotted Owl or its designated CH, and it will not be considered further in this assessment.

### *Piping Plover*

The Piping Plover migrates mainly through the Mississippi Valley and along the Atlantic Coast, and it winters primarily along the Atlantic and Gulf coasts from South Carolina to Texas. In New Mexico this plover is known only as a rare spring (April) migrant, having been verified at Springer Lake (Colfax Co.). This species only occurs as a rare migrant in the analysis area (Stahlecker 1995) and no critical habitat is designated within the Grasslands districts. There is **"No Effect"** to the Piping Plover or its designated CH, and it will not be considered further in this assessment.

### Species Assessment for which USFS Seeks Concurrence

From the species listed in the above table and narrative, the Interior Least Tern (least tern), the Arkansas River shiner (ARS), and the Lesser Prairie-chicken (LPC) are the only species where concurrence is requested.

For estimating the environmental consequences at the programmatic grasslands plan level, the assumption has been made that resource management activities allowed under the Proposed Plan are reasonably foreseeable future actions that will achieve the desired conditions and objectives. The effects analysis of plan components are listed in the respective tables for each species and the plan components are described in Appendix A of this document. However, the specific location, design, and extent of such activities are generally not known at the time. Those decisions are made on a site-specific (project-by-project) basis. Therefore, the discussions here refer to the potential for consequences to occur and are in many cases only estimates. The consequences analyses are useful on a grasslands-wide basis, but are not intended to be applied directly to specific locations on the Grasslands.

### *Arkansas River Shiner (Notropis girardi) including designated critical habitat*

| | |
|---|---|
| Endangered Species Act Status: | Threatened, 1988 |
| National Grasslands Occurrence: | None, however, near BK NG |
| Recovery Plan: | None |
| Critical Habitat: | Designated, 2001 |
| Critical Habitat Occurrence: | None in the Action Area, however near BK NG |
| Effects Determination – Species: | May Affect, Not Likely to Adversely Affect |
| Effects Determination – Critical Habitat: | May Affect, Not Likely to Adversely Affect |

**Life History**

ARS is a small, robust shiner, reaching 51 mm (2 in) in length at maturity (USFWS 2001). The shiner is a generalized forager that feeds on items suspended in the water column as well as on bottom substrates (Bonner et al. 1997, Polivka and Matthews 1997). The shiner inhabits main channels of wide, shallow, sandy-bottomed rivers and larger streams of the Arkansas River basin (Gilbert 1980). Adults are uncommon in backwaters or quiet pools, and almost never occur in tributaries having deep water and bottoms of mud or stone (Cross 1967).

The shiner spawns throughout the months of May, June and July (Polivka and Matthews 1997). Moore (1944) noted that eggs are non-adhesive and drift with the swift current during high flows. Hatching occurs within 24 to 48 hours after spawning. Larvae are capable of swimming within three to four days at which time they seek out backwater pools and quiet water at the mouth of

tributaries where food is more abundant. Longevity is unknown but it is speculated that they do not live longer than three years (Moore 1944).

**Historical and Current Distribution**

Historically, the shiner was widespread and abundant throughout the western portion of the Arkansas River basin in Kansas, New Mexico, Oklahoma and Texas (USFWS 1998).

In New Mexico, the shiner historically inhabited the Canadian River drainage from the Texas state boundary upstream to the Sabinosa Real in San Miguel County, a distance of 193 km (120 mi). In addition, the ARS historically occupied Ute Creek, Revuelto Creek, and Conchas River tributaries of the Canadian River. Of these tributaries, Ute creek has headwaters located North of the Kiowa NG, but does not flow through the analysis area. All four of these historical populations were significantly downstream from Kiowa NG. (Sublette et al. 1990) The shiner is present in the Canadian River drainage in New Mexico downstream from Ute Dam. During the 1970s, the shiner was collected in the Canadian River near Sabinoso (Sublette et al. 1990) approximately 15 miles downstream from Kiowa NG boundary below Mills Canyon.

In Texas, the shiner was found historically throughout the Canadian River from state border to state border, a distance of 370 river km (230mi) (USFWS 1998). Watersheds on the BK NG drain into historical population range on the Canadian River where the Lake Marvin portion occupies a small portion of the 100-year flood plain of occupied habitat in the (South) Canadian River. In addition, the shiner historically occupied the upper reaches of Beaver Creek and its tributaries in the northernmost portion of the panhandle of Texas.

In Oklahoma, the ARS inhabited over 2,736 km (1,700 mi) of four major river systems-Canadian, North Canadian, Cimarron, and Arkansas Rivers. Black Kettle NG is located mostly in the Red River drainage, but a small portion in the northeast corner of BK NG has headwaters that drain into tributary creeks of the Canadian River.

In the western portion of the panhandle of Oklahoma, the shiner is believed to be extirpated in the Beaver River and its tributaries above Optima Reservoir which lies about 82 miles downstream from the Rita Blanca NGs of New Mexico, Oklahoma, and Texas. The shiner is presumed to be present in the Beaver River (North Canadian River), below Optima Reservoir, again about 82 miles downstream of the RB NG.

Currently the ARS is not present in any waters managed by the National Grasslands.

**Status of the Species (Range-wide)**

ARS is federally listed as threatened (USFWS 1998).

Currently, the ARS is almost entirely restricted to 818 km (508 mi) of the Canadian River in Oklahoma, Texas and New Mexico, its range drastically reduced by 80%. These river kilometers are divided into two distinct segments due to significant dams. The upper 217-km (135 mi) segment extends from the upper reaches of Lake Meredith north of Amarillo, Texas to the downstream side of Ute Dam near Logan, New Mexico. The lower 601-km (373 mi) segment extends from the upper reaches of Eufala Reservoir north of McAlester, Oklahoma to the downstream side of Lake Meredith, Texas. An extremely small population may still persist in the Cimarron River in Oklahoma and Kansas (USFWS 1998).

**Status of the Species within Action Area**

Historical records indicate that ARS never resided in waters within the KRB and BKMC NG boundaries and is not present currently.

Historically and at present, the occupied reaches are downstream from these NGs. There is no connectivity between occupied habitat and the KRB NGs due to Ute Dam and Optima Reservoir, which prevent upstream recruitment of the ARS to areas where NG activities may affect shiner populations. Kiowa (K) NGs is located 128.1 km (79.6 mi) upstream from the nearest occupied habitat in the Canadian River, which is downstream from Ute Dam. There is occupied habitat in the Beaver River below Optima Reservoir, located about 132.3 km (82.2 mi) downstream from RB NG which is outside the Action Area.

There is no occupied or suitable habitat within the BK NG. However, the Texas portion of the BK NG manages 218.5 ha (540 ac) of the Boggy Creek watershed (Lake Marvin), which drains into occupied habitat on the Canadian River, only 0.8 km (0.5 mi) downstream from the BK NG boundary.

The Oklahoma portion of the BK NG manages approximately 259 ha (640 ac) of headwaters in watersheds that drain into tributaries of the Canadian River as close as 3.4 km (2.1 mi) downstream from the grassland boundary.

**Threats**

The decline of this species throughout its historical range may be primarily due to listing Factor A, the present or threatened destruction, modification or curtailment of habitat or range. The following limiting factors are derived from Listing Factor A:

- Inundation of habitat and modification of stream flows by impoundments
- channel desiccation by water diversion and excessive groundwater pumping
- stream channelization; and
- the introduction of non-native species.

**Listing Factors**

The following listing factors are taken from the federal listing for the ARS (USFWS 1998).

*Factor A: The present or threatened destruction, modification or curtailment of habitat or range*. Reservoir construction is the most widespread cause of habitat loss for the ARS. Reservoirs have inundated, dewatered, fragmented, or otherwise directly altered on considerable sections of river habitat once inhabited by the species. Not only have reservoirs directly affected habitat immediately upstream of the dam, but downstream altered hydrologic regimes have also significantly reduced ARS habitat (including encroachment of non-native salt cedar *(Tamarix sp.)* and diminished the species ability to successfully reproduce within certain reaches of the river. Water depletion and diversion continues threaten the species, particularly in light of significant reductions to the High Plains Aquifer and projected climate change. Approximately 97 percent of the water pumped from the High Plains Aquifer is used for irrigation, resulting in aquifer level declines in the parts aquifer (including drainages occupied by the ARS which overlie the aquifer) of more than 150 feet since predevelopment. Water depletion and diversion has affected natural hydrologic regimes which the species requires for successful reproduction. Water depletion has had a detrimental effect on water quality by exacerbating existing water quality threats such as nutrient loading and increased chlorides. (USFWS 1998)

*Factor B: Overutilization for commercial, recreational, scientific, or education purposes*. There is no evidence that the ARS is being over-utilized for commercial, recreational, scientific, or educational purposes. (USFWS 1998)

*Factor C: Disease and Predation*. No studies have been conducted on the impact of disease or predation upon the ARS; therefore, the significance of these threats upon existing populations is unknown. There is no direct evidence to suggest that disease threatens the continued existence of the species. (USFWS 1998)

*Factor D: Inadequacy of Existing Regulatory Mechanisms*. Threats continue from streamflow depletion, water quality degradation, and streamflow alteration. Existing regulatory mechanisms either lack the capacity or have not been implemented adequately to decrease or remove these threats. (USFWS 1998)

*Factor E: Other natural and manmade factors affecting the species continued existence*. The overall trend in the status of this species is characterized by dramatic declines in numbers and distribution despite the fact that this species evolved in rapidly fluctuating, harsh environments. The occurrence of a single, catastrophic event, such as the introduction of competing species, a contaminant spill, or a prolonged period of low or no flow, would increase the likelihood of extinction. ARS are undoubtedly capable of recovering from drought, provided other factors have not irreparably degraded their habitat. The fragmentation and apparent isolation of self-sustaining populations of ARS renders the remaining populations vulnerable to any natural or manmade factors that might further reduce population size. (USFWS 1998)

**Effects Analysis**

Historical records indicate that ARS never resided in waters within the KRB, BK, and MC NG boundaries. Historically and at present, the occupied reaches are downstream from lands managed by the NGs.

There is no connectivity between occupied habitat and the KRB NGs due to Ute Dam and Optima Reservoir, which prevents upstream recruitment of the ARS to areas where grassland activities may affect shiner populations. Ka NGs is located 128.1 km (79.6 mi) upstream from the nearest occupied habitat in the Canadian River, which is downstream from Ute Dam. RB NGs is located upstream from occupied habitat in the Beaver River (North Canadian River) below Optima Reservoir about 132.3 km (82.2 miles).

There is no occupied or suitable habitat within the BK NG. However, the Texas portion of the BK NG manages 218.5 ha (540 ac) of the Boggy Creek Watershed (Lake Marvin), which drains into occupied habitat on the Canadian River, only 0.8 km (0.5 mi) downstream from the BK NG boundary.

The Oklahoma portion of the BK NG, manages approximately 259 ha (640 ac) of watersheds that drain into tributaries of the Canadian River as close as 3.4 km (2.1 mi) downstream from the Grasslands boundary.

**7 (a) (1) Conservation Actions on the Grasslands**

The NG have taken no specific recovery efforts for the ARS, as the species does not occur within the KRB, BK, and MC NGs. In general, the implementation of Proposed Plan components related to watershed conditions and grazing management should result in positive effects to the ARS.

**Plan Components**

The Proposed Plan has components for resource areas that affect listed species over the life of the Plan. Desired conditions, objectives, standards, and guidelines from resources areas are listed in Appendix A of this document. The resource area and number-coded plan components are described in detail there.

The following table lists number coded plan components and provides an Effects Analysis Summary that shows how the Proposed Plan will promote protection and recovery of the ARS.

**Table 2 Arkansas River Shiner and Critical Habitat Effects Summary**

| Arkansas River Shiner | | |
|---|---|---|
| Resource Program | Plan Component Code # | Effects Analysis Summary |
| Grassland-wide | | |
| Motorized Recreation and Roads and Access | 1-5 | Impacts to downstream habitat for the ARS will be minimized through motorized-route designations since routes will generally avoid riparian or wetland areas. New routes are not being proposed near lakes or in habitat that drains into occupied habitat. Recreation associated with lakes will not affect occupied habitat for the ARS. There is no OHV use on river habitat in the analysis area. |
| Land Adjustments | 6-7 | Habitats determined to be important to the ARS may be acquired if there is a willing seller. |
| Minerals and Energy Development | 8-9 | Surface occupancy (oil and gas development) adjacent to riparian/wetland areas, will not be allowed, indirectly benefitting the ARS. The potential for pollutants and sediments entering the waterways within and upstream of occupied habitat in the Canadian River will be substantially reduced protecting water quality and fish populations. |
| Livestock Use | 13-15 | Livestock grazing will be managed to provide for the downstream habitat needs of the ARS through management of sediment, retention of adequate residual ground cover, and avoiding the placement of supplements near watercourses indirectly benefitting the ARS. |
| General Ecological | 20 | Aquatic habitat is managed for the benefit of native species and the downstream populations of ARS are sustained. |
| Climate Change | 24 | Adaptive management and ecosystem resiliency will allow shifting of aquatic plant communities across the landscape which may indirectly benefit the ARS. |
| Soil, Water, Air | 25-26 | Soil disturbing activities are designed to prevent sediment discharge into streams which will protect downstream habitat for the ARS. |
| Water, Watershed etc. | 27-34 | These plan components generally reduce impacts in riparian, wetland and aquatic habitat by stabilizing streambanks and channels, maintaining proper functioning condition of riparian and aquatic habitat, reducing plant and animal invasive species and limiting certain uses such as OHVs in aquatic habitats. Although the plan components were not developed specifically for the ARS, the species will benefit from the Proposed Plan. |
| Invasive Plants and Animal Species | 35 | Introduction of invasive predatory fish would be minimized reducing predation of ARS. |
| Black Kettle and McClellan Creek Management Area | | |
| Minerals and Energy Development-Oil and Gas Leasing Standards | 40 | Surface occupancy (oil and gas development) adjacent to riparian/wetland areas and Lake Marvin, will not be allowed, indirectly benefitting the ARS. The potential for pollutants and sediments entering the waterways within and upstream of occupied habitat in the Canadian River will be substantially reduced protecting water quality and fish populations. |

**Critical Habitat**

Critical habitat for the ARS has the following attributes:

1. A complex, braided channel with pool, riffle run, and backwater components that provide a suitable variety of depths and current velocities in appropriate seasons
2. A suitable un-impounded stretch of flowing water of sufficient length to allow hatching and development of the larvae

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3. Substrates of predominantly sand, with some patches of silt, gravel, and cobble
4. Water quality characterized by low concentrations of contaminants and natural, daily and seasonally variable temperature, turbidity, conductivity, dissolved oxygen, and pH
5. Abundant terrestrial, semi-aquatic, and aquatic invertebrate food base, and
6. Few or no predatory or competitive nonnative species present (USFWS 2001).

Of the six primary constituent elements listed above, water quality can be influenced by NG activities, which in turn can effect food base and substrate composition in localized areas. Water quality, especially turbidity and pollutants, is affected by road engineering which includes maintenance and design and the stability of the soil on the watershed.

In a previous proposed rule, the USFWS excluded previously designated CH in Unit 1a of the Canadian River in New Mexico, Texas, and a portion of Unit 1b in Texas and Oklahoma under authority of section 4 (b)(2) of the Act (USFWS 2005).

Critical habitat was first designated for the ARS in 2001 but none of the river segments designated as CH are located on USFS managed lands in the Action Area (USFWS 2001). In 2005, CH was excluded in Units 1a and 1b due to many factors. Unit 1a is located 79.6 mi. downstream from the K NG. Critical habitat was excluded in Unit 1a because there are occasional periods of no flow, large areas are under private ownership, and many areas lack features essential to the conservation of the species. In New Mexico the Canadian River rarely contains suitable habitat due to the influence of the Ute Reservoir. The Canadian River flows through the K NG in Mills Canyon, but Unit 1a is downstream from Ute Dam so there is no direct or indirect connection between the CH and the K NG. The RB NG is located 82.2 mi. upstream from the uppermost previous CH in the Beaver River, which is downstream from Optima Dam. There is no direct or indirect connection between the previous CH in the Beaver River and the RB NG.

The BK NG manages units in Texas and Oklahoma that drain into previously designated CH (Unit 1b) in the Canadian River. The Texas portion of the grassland manages 540 ac of the Boggy Creek Watershed near Lake Marvin in Hemphill County, which drains into previously designated CH on the Canadian River about 0.5 mi. downstream from the NG boundary. The Oklahoma portion manages approximately 640 ac. of watersheds that drain into previously designated CH in the Canadian River as close as 2.0 mi. downstream from the grassland boundary in Roger Mills County. Critical habitat has been excluded in Unit 1b because it is predominantly in private ownership with limited areas of state and tribal ownership and areas in Unit1b that have been excluded from CH designation do not meet the definition of CH.

**Effects Analysis (Critical Habitat)**

Designation for CH has been removed for areas that would have had indirect affects to the ARS from lands managed by KRB, BK, and MC NG. Even though critical habitat has been removed, riparian, wetland, wildlife and threatened and endangered species values and habitats are protected by Plan Components in the Proposed Plan.

**Determination of Effects (Critical Habitat)**

The Proposed Plan will have discountable indirect effects to critical habitat, because:

- Critical habitat has been removed from areas in unit 1a and 1b that occurred adjacent to or drained into previously designated critical habitat
- USFS has limited ownership

- Plan Components promote protection and recovery of listed species as well as riparian, wetland and wildlife values and habitat.

Therefore, the implementation of the Proposed Plan **"May Affect, but is Not Likely to Adversely Affect, CH."**

**Direct Effects**

The Proposed Plan provides a programmatic framework that guides site-specific actions but does not authorize, fund, or carry out any project or activity. Because the land management plan does not authorize or mandate any site-specific activities or ground-disturbing actions, there can be no direct effects. However, there may be implications or longer term environmental consequences of managing the grasslands under this programmatic framework.

After the Plan is implemented, all site-specific activities must conform to the programmatic framework set up in the Proposed Plan and they must meet site-specific NEPA and ESA requirements.

**Indirect Effects**

The Proposed Plan identifies plan component objectives that are interrelated to achieving desired conditions as follows:

- Within 15 years of plan approval, rehabilitate all unauthorized routes and decommissioned roads, where resource damage is occurring and as funds are available.
- Restore 100 percent of the riparian areas to cottonwood-willow vegetation type species through plantings, seeding, and/or mechanical or chemical methods within 15 years of plan approval.

The indirect effects of the 2 objectives stated above have the outcome of reducing or limiting sedimentation from road activity and through restoration of riparian vegetation. The effect to the ARS from road rehabilitation would be negligible considering the BK NG in Texas manages 218.5 ha (540 ac) of the Boggy Creek Watershed (Lake Marvin), and in Oklahoma, manages 477 ha (1,180 ac) that are separated from CH by dams that trap sediment from the runoff of these areas. The effect to the ARS from restoration of cottonwood-willow riparian action would be beneficial to water quality; however, the effect will be insignificant because the cottonwood-willow vegetation on K NGs is located 128.1 km (79.6 mi) upstream from the upper most occupied habitat in the Canadian River and separated by Ute Dam.

**Cumulative Effects**

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological assessment. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

The administrative boundaries of the Grasslands encompass units that are not contiguous adjoined tracts. Private, State, and County managed lands are in the action area. Activities from these entities that have potential to affect the shiner and its CH would be those activities that affect water quality such as sedimentation from road and construction projects and agriculture practices that result in erosion. The rural nature and population stability of the action area would not indicate increased road and construction activities. Agriculture practices or vegetation

management that could result in increased runoff would allow more sedimentation and reduced water quality; however, it is unlikely that an increase in these activities will occur in the foreseeable future and existing dams trap the sediment before it can reach occupied or CH.

The States of Oklahoma and Texas stock some of the lakes and ponds managed by the Grasslands with game fish and desirable non-native fish. The fish are stocked in impounded water and are separated from occupied and CH by dams or a lack of direct connectivity.

**Determination of Effects (Species)**

All waters occupied by the ARS do not occur within the BK NGs, yet the BK NGs manages 1,180 acres of headwaters of watersheds that drain into tributaries that are connected to occupied habitat, which is an insignificant amount of the hydrological basin that contributes to ARS occupied habitat.

As presented in Table 2 above, 26 plan components applicable to ARS, will benefit the species based on long term improvement and protection of habitat.

Based on the analysis of the plan components relating to the ARS, the implementation of the Proposed Plan will have will have insignificant and/or discountable effects to the ARS because

- USFS has limited ownership of lands that drain into the overall range of the species, and
- Plan Components promote protection and recovery of listed species.

The implementation of the Proposed Plan, **"May Affect but is Not Likely to Adversely Affect"** the ARS.

**Summary**

Based on the analysis of the plan components relating to the ARS, the implementation of the Proposed Plan will have will have insignificant and/or discountable effects to the ARS because:

- USFS has limited ownership of lands that drain into the overall range of the species, and
- Plan Components promote protection and recovery of listed species.

The Proposed Plan will have discountable indirect effects to CH, because:

- Critical habitat has been removed from areas in unit 1a and 1b that occurred adjacent to or drained into previously designated critical habitat
- USFS has limited ownership and manages 1,180 acres of headwaters of watersheds that drain into tributaries that are connected to occupied habitat, which is an insignificant amount of the hydrological basin that contributes to ARS occupied habitat.
- Plan Components promote protection and recovery of listed species as well as riparian, wetland and wildlife values and habitat.

Therefore, the USFS concludes that the Proposed Plan **"May Affect, but is Not Likely to Adversely Affect"** the ARS and its designated critical habitat.

***Interior Least Tern (Sterna antillarum athalassos)***

| | |
|---|---|
| Endangered Species Act Status: | Endangered, 1985 |
| National Forest Occurrence: | Black Kettle NG |

| | |
|---|---|
| Recovery Plan: | Yes, 1990 |
| Critical Habitat: | None Designated |
| Determination of Effect (Species): | **May Affect, Not Likely to Adversely Affect** |

**Life History**

Interior Least Terns (least tern) arrive at breeding areas from late April to early June. They nest on open, sandy or gravelly areas. Least terns nest in colonies (called "ternaries"); nests can be as close together as a few meters or widely scattered over hundreds of meters. Nests are a shallow scrape in the ground, in which two to three eggs are laid in May. Both sexes incubate the eggs, which hatch in June or July. Chicks fledge in three weeks. Adults and fledglings vacate the ternaries by early September. Least terns feed on small fish (USFWS 1990).

Nesting habitat of the least tern includes bare or sparsely vegetated sand, shell, and gravel beaches, sandbars, islands, and salt flats associated with rivers and reservoirs. The birds prefer open habitat, and tend to avoid thick vegetation and narrow beaches. Sand and gravel bars within a wide unobstructed river channel, or open flats along shorelines of lakes and reservoirs, provide favorable nesting habitat. Nesting locations are often at the higher elevations away from the water's edge, since nesting usually starts when river levels are high and relatively small amounts of sand are exposed. The size of nesting areas depends on water levels and the extent of associated sandbars and beaches. Highly adapted to nesting in disturbed sites, least terns may move colony sites annually, depending on landscape disturbance and vegetation growth at established colonies.

For feeding, least terns need shallow water with an abundance of small fish. Shallow water areas of lakes, ponds, and rivers located close to nesting areas are preferred.

The USFWS has a recovery plan in effect for the least tern (USFWS 1990).

**Historical and Current Distribution**

Historically, the least tern bred along the Colorado, Red, Rio Grande, Arkansas, Missouri, Ohio, and Mississippi Rivers systems from Montana southward through South Dakota, Nebraska, eastern Colorado, Iowa, Kansas, Missouri, Illinois, Indiana, Kentucky, eastern New Mexico, Oklahoma, Arkansas, Tennessee, central Texas, central Louisiana, and central Mississippi. The actual wintering area is unknown.

Currently, the least tern still occurs in most of the historical river systems, but breeding colonies have been restricted to less altered river segments. The least tern no longer nests on the Missouri River and approximately half of the existing population breeds along the lower reaches of the Mississippi River between Cairo, Illinois and Vicksburg, Mississippi.

**Status of the Species (Range-wide)**

The amount of breeding habitat for the least tern has declined throughout its entire range. In one instance, a section of the Missouri River on the Nebraska-Iowa border was estimated to have had 10, 125 ha (25,000 ac) of potential nesting habitat (USFWS 1985). Approximately 99% of this habitat has been lost. Along the Nebraska-South Dakota border, approximately 3,156 ha (7,800 ac) of sandbar habitat was lost between 1956 and 1975. Sandbars along Nebraska's entire Missouri River border has been reduced to 890 ha (2,200 ac) along the 53 km (50 mi) Missouri National Recreation River (USFWS 1990).

The reason for the decline in breeding habitat is the alteration of natural hydrologic processes within these large river systems. Due to channelization, irrigation withdrawals, and construction of reservoirs and ponds, normal water and sediment flow has been restricted. With no new sediment deposited within these river systems, new sandbars are not created as old sandbars are destroyed. Also, impeding water flow prevents scouring of vegetation on existing sandbars. This leads to vegetative succession on these sandbars, which eventually makes the sandbars unsuitable for nesting least terns (USFWS 1990).

In addition to habitat loss, human recreation on river islands has been increasing and may be inhibiting reproductive success in the remaining areas of suitable habitat (USFWS 1990).

Data from the recovery plan shows 150 known nesting locations of least terns throughout its range. One hundred and forty-three of these sites (95%) occur along the Missouri, Mississippi/Ohio, and Arkansas Rivers. Census data from 1988, counted a total of 4,702 least terns along approximately 3,308 km (2,055 mi) of river, for an average of 1.4 terns/km (2.3 terns/mi). However, 2,356 least terns occurred on the 1,100 km (684 mi) of the Mississippi River from Cape Girardeau, Missouri, to Vicksburg, Mississippi. This represents 50% of the known population at an average density of 21 terns/km (3.4 terns/ mi) (USFWS 1990).

**Status of the Species within Action Area**

The Grasslands provide habitat for some species that are not directly related to managed vegetation types. At full pool levels, there can be about 5,000 acres of aquatic lake habitat available for the least tern, a species known to forage the waters of some lakes managed by BK and MC NG.

No least tern breeding occurs within the action area of the NG. The nearest breeding area to NG is along the South Canadian River, Texas, approximately 8 mi north of the BK NG. There are about six breeding pairs of least terns in that area. Least terns use lakes on the BK NG, on Skipout, Dead Warrior, (previously known as Dead Indian) and Springcreek Lakes in Oklahoma and Lake Marvin and Lake McClellan in Texas for foraging, and are typically present from July until mid-September.

**Threats**

**Listing Factors**

The following listing factors are taken from the federal listing for the least tern (USFWS 1985).

*Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range*. The construction of reservoirs and pools along rivers has permanently eliminated some islands and prevents the formation of others. Such reservoirs and pools exist along hundreds of miles of rivers of the Mississippi Basin. Stretches of river below dams are so regulated that a river's natural erosion and deposition processes, which are responsible for creating, destroying, and maintaining nesting islands, no longer occur. The controls on the river have reduced the spring floods, which would normally scour vegetation from islands, and have limited the amount of alluvium for island formation. Consequently, on most of the remaining islands, herbaceous vegetation is followed by shrub and tree species, which ultimately form the permanent vegetation of the island, a condition unsuitable for nesting interior least terns.

*Factor B. Overutilization for commercial, recreational. scientific, or educational purposes*. Not applicable for the species.

*Factor C. Disease or predation*. Disease has not been a problem known to occur in this species. Coyotes and foxes prey on least tern eggs, and evidence exists that such predation can have a serious impact on nest success. Dogs and other domestic animals accompanying human use of sandbars can disrupt least tern nesting through disturbance or predation.

*Factor D. The inadequacy of existing regulatory mechanisms*. The least tern is listed as threatened or endangered by the States of South Dakota, Nebraska, Iowa, Illinois, Missouri, Kansas, New Mexico, and Texas. As a general rule, however, such listings do not result in State protection of the habitat of this species. The Migratory Bird Treaty Act (16 USC. 703 et seq.) protects the bird and its parts, nests, and eggs from taking and trade. However, this Act does not protect against habitat loss, which is the main threat to the least tern, and, by itself, will not be adequate to prevent the species' further decline. The Endangered Species Act would offer additional protection for the species, largely through the recovery and consultation processes.

*Factor E. Other natural or manmade factors affecting its continued existence*. None are known.

**Effects Analysis**

The least tern can be found foraging on Lake Marvin and Lake McClellan in Texas, as well as Dead Indian, Skipout, and Springcreek, in Oklahoma, and ponds within the BK NG from July until mid-September. No breeding habitat exists in the action area on NG. The nearest breeding area is along the South Canadian River, approximately 13km (8 mi) north of the BK NG.

**7 (a) (1) Conservation Actions on the Cibola NF**

The NG have taken no specific recovery efforts for the least tern, as there is no breeding habitat on the Grasslands and the species is only seen foraging on the lakes within the BKMC NGs. In general, the implementation of Proposed Plan components related to watershed conditions and grazing management should result in positive effects to the least tern.

**Plan Components**

The Proposed Plan has components for resource areas that affect listed species over the life of the Plan. Desired conditions, objectives, standards, and guidelines from resources areas are listed in Appendix A of this document. The resource area and number coded plan components are described in detail there.

Overall, the Proposed Plan includes plan components which, in general, are positive for the least tern. Many of these plan components direct the NG to manage preferentially for ESA listed species. Furthermore, many of the plan components are designed to improve the overall health and diversity of ecological conditions across the landscape.

The following table lists number coded plan components and provides an Effects Analysis Summary that shows how the Proposed Plan will promote protection and recovery of the least tern.

**Table 3 Interior Least Tern Effects Summary**

| Interior Least Tern | | |
|---|---|---|
| **Resource Program** | **Plan Component Code #** | **Effects Analysis Summary** |
| **Grassland-wide** | | |
| Motorized | 1-5 | Impacts to foraging habitat for the least tern will be minimized |

| Interior Least Tern | | |
|---|---|---|
| **Resource Program** | **Plan Component Code #** | **Effects Analysis Summary** |
| Recreation and Roads and Access | | through motorized-route designations since routes will generally avoid riparian or wetland areas. New routes are not being proposed near lakes used as foraging habitat. Recreation associated with lakes will not affect foraging habitat for the tern. There is no OHV use on sandbars or river habitat in the analysis area. |
| Land Adjustments | 6-7 | In general, land acquisitions will focus on wetland and riparian habitat. Riparian or wetland habitat will not be targeted for disposal. Acquisitions would indirectly benefit the Interior Least Tern. |
| Minerals and Energy Development and Standards for Oil and Gas Leasing | 8-10 | Surface occupancy (oil and gas development) adjacent to riparian/wetland areas, Lake Marvin, and Lake McClellan will not be allowed, indirectly benefitting the least tern. The potential for pollutants and sediments entering the waterways within and upstream of breeding areas will be substantially reduced protecting water quality and fish populations in foraging areas. |
| Livestock Use | 13-15 | Livestock grazing will be managed to provide for the foraging needs of the least tern through management of sediment, retention of adequate residual ground cover, and avoiding the placement of supplements near watercourses. Livestock trampling of nests is not likely since there is no known breeding habitat on the Grasslands. |
| General Ecological | 20, 23 | These plan components and recovery plans, promote native ecosystems, species richness and diversity, habitat linkages, and natural processes which indirectly benefit foraging habitat for the least tern. |
| Climate Change | 24 | Adaptive management and ecosystem resiliency will allow shifting of terrestrial and aquatic plant communities across the landscape which may indirectly benefit the least tern. |
| Water, Watershed etc. | 26-35 | Maintaining the proper functioning condition of area lakes and restricting or mitigating OHV use in aquatic systems will maintain tern foraging habitat. |
| Black Kettle and McClellan Creek Management Area | | |
| Minerals and Energy Development-Oil and Gas Leasing Standards | 40 | Surface occupancy (oil and gas development) adjacent to riparian/wetland areas and Lake Marvin, will not be allowed, indirectly benefitting the least tern. The potential for pollutants and sediments entering the waterways within and upstream of occupied habitat in the Canadian River will be substantially reduced protecting water quality and fish populations. |

**Direct Effects**

The Proposed Plan provides a programmatic framework that guides site-specific actions but does not authorize, fund, or carry out any project or activity. Because the land management plan does not authorize or mandate any site-specific activities or ground-disturbing actions, there can be no direct effects. However, there may be implications or longer term environmental consequences of managing the grasslands under this programmatic framework.

After the Plan is implemented, all site-specific activities must conform to the programmatic framework set up in the Proposed Plan and they must meet site-specific NEPA and ESA requirements.

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**Indirect Effects**

The Proposed Plan has components developed that would indirectly benefit the least tern through desired conditions designed to improve conditions over time. The coded plan components from Appendix A lists desired conditions, objectives, standards, and guidelines related to motorized recreation, 1-5, minerals/energy development 8-10, and 40, livestock use, 13-15, improvement of watershed conditions 26-35 that should result in positive effects to the least tern by protecting foraging habitat.

Recreational activities on lakes could disturb foraging terns such as fishing from boats and recreational boating during the summer months. The type and intensity of recreational activities suggests that these effects could disturb some least terns, but not to the extent that it would rise to the level of incidental take. Foraging habitat was not identified as a limiting factor or a threat to the species in the listing document. Therefore, this effect is likely to be insignificant and discountable.

**Critical Habitat**

There is no critical habitat designated for the least tern within the Action Area of the proposed plan.

**Cumulative Effects**

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological assessment. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

The administrative boundaries of the Grasslands encompass units that are not contiguously adjoined tracts. Private, State, and County managed lands are in the action area. Activities from these entities that have potential to affect least terns would be those activities that affect water quality such as sedimentation from road and construction projects and agriculture practices or vegetation management that result in erosion due to water. The Grasslands manage least tern foraging areas in lakes within the action area and are surrounded by vegetative buffers and riparian areas; also these lakes do not have current flows that would carry sediment.

The States of Oklahoma and Texas stock some of the lakes and ponds managed by the Grasslands with game fish and desirable non-native fish. The game fish may feed on minnows and could reduce foraging resources for the least tern.

**Determination of Effects (Species)**

As presented in Table 3 above, 25 plan components applicable to least tern will benefit the species based on long term improvement and protection of habitat.

**Summary**

Based on the analysis of the plan components relating to the least tern, the implementation of the Proposed Plan will have insignificant and/or discountable effects to the least tern because

- Under the direction of the Proposed Plan there are no activities proposed to construct reservoirs or ponds on the Canadian River or its tributaries.

- Plan Components promote protection and recovery of listed species.
- While recreational activities on Grasslands lakes could disturb foraging terns during the summer months, the type and intensity of recreational activities suggests that these effects would be insignificant and discountable to the species
- The Proposed Plan has standards for oil and gas leasing that controls surface use, and open pits are not allowed which could attract foraging least terns.

Therefore, this rationale supports the conclusion that the implementation of the Proposed Plan **"May Affect**, but is **Not Likely to Adversely Affect"** the least tern.

### *Lesser Prairie-chicken (Tympanuchus pallidicinctus)*

| | |
|---|---|
| Endangered Species Act Status: | Candidate (LPN 2) |
| National Forest Occurrence: | Black Kettle and Kiowa/Rita Blanca NG) |
| Recovery Plan: | None Designated |
| Critical Habitat: | None Designated |
| Determination of Effect (Species): | **Not Likely to Jeopardize** |
| Determination of Effect (if listed): | **May Affect, Not Likely to Adversely Affect** |

**Life History**

The following discussion is taken partially from the USFWS 2010 Species Assessment and Listing Priority Assignment Form. The species assessment describes natural history, distribution and threats to the LPC. Portions of the species assessment are incorporated by reference into this BA as summarized below.

The LPC is a species of prairie grouse endemic to the southern high plains of the U.S., commonly recognized for its feathered feet, stout build, ground-dwelling habit, and mating behavior. Plumage of the LPC is characterized by a cryptic pattern of alternating brown and buff-colored barring. Males have long tufts of feathers (pinnae) on the sides of the neck that are erected during courtship displays. Males also display brilliant yellow supraorbital eyecombs and reddish esophageal air sacs during courtship displays (Copelin 1963, p. 12; Johnsgard 1983, p. 318). LPC are polygynous and exhibit a lek mating system. Male LPC gather to display on leks at dusk and dawn beginning in late February through early May (Copelin 1963, p. 26; Hoffman 1963, p. 730; Crawford and Bolen 1976, p. 97).

Females arrive at the lek in early spring and peak hen attendance at leks is mid-April (Copelin 1963, p. 26; Haukos 1988, p. 49). The sequence of vocalizations and posturing of males is often described as "booming",gobbling, yodeling, bubbling, or duetting," has been described by Johnsgard (1983, p. 336) and Haukos (1988, pp. 44-45). After mating, the hen selects a nest site, usually 0.6 to 2 mi from the lek (Giesen 1994a, p. 97), constructs a nest, and lays an average clutch of 10-14 eggs (Bent 1932, p. 282). Nests generally consist of bowl shaped depressions in the soil. Nests are lined with dried grasses, leaves, and feathers and there is no evidence that nests are reused in subsequent years (Giesen 1998, p. 9). Second nests may occur when the first attempt is unsuccessful (Coats 1955, p. 5). Incubation lasts 23-26 days and young leave the nest within hours of hatching. Broods may remain with females for 6-8 weeks. Giesen (1998, pp. 2-9) provides a comprehensive summary of LPC breeding behavior, habitat, and phenology (relationship between periodic biological phenomena and climatic conditions).

Home range varies both by sex and by season. Males tend to have smaller home ranges than do females, with the males generally remaining closer to the leks than do the females (Giesen 1998, p. 11). Giesen (1998, p. 11) observed that spring and summer home ranges for males were 211 hectares (ha) (512 acres (ac)) and for females were 596 ha (1,473 ac). In Texas, Taylor and Guthery (1980a, p. 522) found that winter monthly home ranges for males could be as large as 1,945 ha (4,806 ac) and that subadults tended to have larger home ranges than did adults. Based on observations from New Mexico and Oklahoma, LPC home ranges increase during periods of drought (Giesen 1998, p. 11). Davis (2005, p. 3) states that the combined home range of all LPC at a single lek is about 49 sq km (19 sq mi or 12,100 ac).

The diet of the LPC consists primarily of insects, seeds, leaves, buds, and cultivated grains (Giesen 1998, p. 4). Juveniles tend to forage primarily on insects such as grasshoppers and beetles while adults tend to consume a higher percentage of vegetative material (Giesen 1998, p. 4). This is particularly true in the fall and winter when insects are less abundant.

LPC have a relatively short life span and high annual mortality. Campbell (1972, p. 689), using nine years of band recovery data, estimated annual mortality for males to be 65 percent. Hagen et al. (2005, p. 82) specifically examined survival in male LPC and found apparent survival varied by year and declined with age. Annual mortality was estimated to be 0.55 (Hagen et al. 2005, p. 83). Campbell (1972, p. 694) estimated a 5-year maximum life span, although an individual nearly 7 years old has been documented in the wild by the Sutton Avian Research Center (Wolfe 2010).

The preferred habitat of the LPC is mixed sand sagebrush- (*Artemesia filifolia*) or shinnery oak- (*Quercus havardii*) grasslands (hereafter described as native rangeland) (Taylor and Guthery 1980b, p. 6; Giesen 1998, pp. 3-4). Trees and other tall woody vegetation are typically absent from these grassland ecosystems, except along water courses. Native grasslands occupied by the LPC often include small shrubs which are important for summer shade, winter protection, and as supplemental foods. Landscapes supporting less than 63 % native rangeland appear incapable of supporting self-sustaining LPC populations (Giesen 1998, p. 4). Correspondingly, Crawford and Bolen (1976, p. 102) found that landscapes having greater than 20 to 37 percent cultivation may not support stable LPC populations.

The shinnery oak vegetation type is endemic to the southern great plains and is estimated to have historically covered an area of 2.3 million ha (over 5.6 million ac), although its current range has been considerably reduced through eradication (Mayes et al. 1998, p. 1609). The distribution of shinnery oak overlaps much of the historic LPC range in New Mexico, Oklahoma, and Texas (Peterson and Boyd 1998, p. 2). Shinnery oak is a rhizomatous (a horizontal, usually underground stem that often sends out roots and shoots from its nodes) shrub that reproduces slowly and does not invade previously unoccupied areas (Dhillion et al. 1994, p. 52).

Leks are characterized by sparse vegetation and are generally located on elevated features such as ridges or grassy knolls (Giesen 1998, p. 4). Vegetative cover characteristics, primarily height and density, may have a greater influence on lek establishment than elevation (Giesen 1998, p. 4). Several authors, as discussed in Giesen (1998, p. 4), observed that roads, oil and gas pads, and similar forms of human disturbance create habitat conditions which may encourage lek establishment. However, Taylor (1979, p. 707) emphasized that human disturbance, which is often associated with these artificial lek sites, is detrimental during the breeding season and did not encourage construction of potential lek sites in areas subject to human disturbance. Giesen (1998, p. 9) reported that hens usually nest and rear broods within 3 km (1.7 mi) of leks and usually nest near a lek other than the one on which they mated.

Nests are often located on north and northeast facing slopes as protection from direct sunlight and the prevailing southwest winds (Giesen 1998, p. 9). Habitat used by young is similar to that of adults and the daily movements of the broods are usually 984 feet or less. After the broods break up, the juveniles form mixed flocks with adult birds and juvenile habitat use is similar to that of adult birds. Giesen (1998, p. 4) reports that wintering habitat is similar to that used for breeding with the exception that small grain fields are used more heavily during this period than during the breeding season.

Prairie grouse, including the LPC, require large expanses (i.e., 1,024-10,000 ha (2,530-24,710 ac)) of unfragmented, ecologically diverse native rangelands to complete their life cycles (Woodward et al. 2001, p. 261; Flock 2002, p. 130; Fuhlendorf et al. 2002, p. 618; Davis 2005, p. 3), more so than almost any other grassland bird (Johnsgard 2002, p. 124). Although precise values have yet to be quantified, home range size and movements of individual animals help provide a rough estimate of the extent of land that may be required to sustain a population of LPC. As reported by Giesen (1998, p. 11) and Taylor and Guthery (1980a, p. 522), a single LPC may have a home range of 211 ha (512 ac) to 1,945 ha (4,806 ac). More recently, studies in Kansas demonstrated some birds may move as much as 50 km (31 mi) from their point of capture (Hagen et al. 2004, p. 71). While some overlap in home ranges is expected, rarely would those home ranges be expected to overlap completely. Taylor and Guthery (1980b, p. 11) used LPC movements in west Texas to estimate the area needed to meet the minimum requirements of a lek population. They determined that a contiguous area of at least 32 sq km (3,200 ha; 7,900 ac) and having no less than 63 percent rangeland habitat are need to support a LPC population long-term. More recently, observations by scientists involved in LPC conservation have speculated that over 16,000 ha (40,000 ac) may actually be needed to sustain a single LPC lek (Wolfe 2008). Because LPC typically nest and rear their broods in proximity to a lek other than the one used for mating (Giesen 1998, p. 9), a complex of two or more leks is likely required to sustain a viable population of LPC. Hagen et al. (2004, p. 76) recommended that LPC management areas be at least 4,096 sq km (1,581 sq mi) in size. A population viability analysis for the LPC, once conducted, would allow a more precise estimation of the amount of suitable habitat needed to sustain a single, viable LPC population.

**Historical and Current Distribution**

Historically, the LPC occupied native rangeland in portions of southeastern Colorado (Giesen 1994b, pp. 175-182), southwestern Kansas (Schwilling 1955, p. 10), western Oklahoma (Duck and Fletcher 1944, p. 68), the Texas panhandle (Henika 1940, p. 15; Oberholser 1974, p. 268), and eastern New Mexico (Ligon 1927, pp. 123-127). Johnsgard (2002, p. 32) estimates the maximum historical range encompassed some 260,000 to 388,500 sq km (100,000 to 150,000 sq mi), with about two-thirds of the range occurring in Texas. In 2007, cooperative mapping efforts by the Colorado Division of Wildlife (CDOW), Kansas Department of Wildlife and Parks (KDWP), NMGDF, Oklahoma Department of Wildlife Conservation (ODWC), and Texas Parks and Wildlife Department (TPWD), in cooperation with the Playa Lakes Joint Venture, re-estimated the maximum historical and occupied ranges. They determined the maximum occupied range, prior to European settlement, to have been approximately 456,087 sq km (176,096 sq mi) (Playa Lakes Joint Venture 2007, p. 1). The approximate historical range, by state, based on this cooperative mapping effort is 21,911 sq km (8,460 sq mi) in Colorado, 76,757 sq km (29,640 sq mi) in Kansas, 52,571 sq km (20,300 sq mi) in New Mexico, 68,452 sq km (26,430 sq mi) in Oklahoma, and 236,398 sq km (91,280 sq mi) in Texas.

By the 1880s, the area occupied by LPC was estimated at 358,000 sq km (138,225 sq mi), and by 1969, the occupied range had declined to an estimated 125,000 sq km (48,263 sq mi) due to wide scale conversion of native prairie to cultivated cropland (Taylor and Guthery 1980b, p. 1, based

on Aldrich 1963, p. 537). By 1980, occupied range was estimated at 27,300 sq km (10,541 sq mi) (Taylor and Guthery 1980b, p. 4).

LPC still occur within each state (Giesen 1998, p. 3). During the 2007 mapping effort (Playa Lakes Joint Venture 2007, p. 1), the State wildlife agencies estimated the current LPC occupied range encompassed 64,414 sq km (24,871 sq mi) (Fig. 1). The approximate occupied range, by state, based on this cooperative mapping effort is 4,216 sq km (1,630 sq mi) in Colorado, 29,130 sq km (11,250 sq mi) in Kansas, 8,570 sq km (3,310 sq mi) in New Mexico, 10,969 sq km (4,235 sq mi) in Oklahoma, and 12,126 sq km (4,680 sq mi) in Texas.

The overall distribution of LPC within all states except Kansas has sharply declined, and the species is generally restricted to limited parcels of untilled native rangeland or areas with significant Conservation Reserve Program (CRP) enrollments that were initially seeded with native grasses. The estimated current occupied range represents an 86 % reduction in overall occupied range since pre-European settlement.

**Status of the Species (Range-wide)**

Little information is available on LPC population size prior to 1900. Litton (1978, p. 1) suggested that as many as two million birds may have occurred in Texas alone prior to 1900. Although, we are not aware of any independent analysis to corroborate Litton‘s estimate, and the basis for his estimate is unknown, the LPC was reportedly quite common throughout its range in Colorado, Kansas, New Mexico, Oklahoma, and Texas in the early twentieth century (Bent 1932, pp. 280-281,283; Baker 1953, p. 8; Bailey and Niedrach 1965, p. 51; Sands 1968, p. 454; Fleharty 1995, pp. 38-44). By the 1930s, the species had begun to disappear from areas where it had been considered abundant and the decline was attributed to extensive cultivation, overgrazing by livestock, and drought (Bent 1932, pp. 283-284; Baker 1953, p. 8; Bailey and Niedrach 1965, p. 51; Davison 1940, p. 58; Lee 1950, p. 475; Oberholser 1974, p. 268; Sands 1968, p. 454). LPC abundance appeared to fluctuate somewhat during the 1940s and 1950s (Copelin 1963, p. 24; Snyder 1967, p. 121; Crawford 1980, p. 2), and by the early 1970s the total fall population may have been reduced to about 60,000 birds (Crawford 1980, p. 2). By 1980, the estimate of the total fall population was approximately 44,000 to 53,000 birds (Crawford 1980, p. 3).

**State-by-State Information on Population Status within the Action Area**

Each of the State wildlife agencies within the occupied range of the LPC provided the USFWS with information regarding the current status of the LPC within their respective states, and most of the following information was taken directly from agency reports, memos, and other status documents provided to USFWS. Most states collect data in the form of one or both of the following indices: average lek size (i.e., number of males or total birds per lek); or density of birds or leks within a given area. In the absence of bird density, the number of active leks over large areas was recommended as the most reliable trend index for prairie grouse populations (Cannon and Knopf 1981, p. 777; Hagen et al. 2004, p. 79).

New Mexico In the 1920s and 1930s, the former range of the LPC in New Mexico was described as all of the sand hill rangeland of eastern New Mexico, from Texas to Colorado, and as far west as Buchanan in DeBaca County. Ligon (1927, pp. 123-127) mapped the breeding range at that time as encompassing portions of seven counties, a small subset of what he described as former range. Ligon (1927, pp. 123-127) depicted the historic range in New Mexico as encompassing all or portions of 12 counties. In the 1950s and 1960s, occupied range was more extensive than what was the known occupied range in 1927 (Davis 2005, p. 6), indicating reoccupation of some areas since the late 1920s. Presently, the NMDGF reports that LPC are known or suspected from portions of seven counties and the occupied range of LPC in New Mexico is conservatively

estimated to encompass approximately 5,698 sq km (2,200 sq mi) (Davis 2006, p. 7) compared with its historic range of 22,390 sq km (8,645 sq mi). Based on the cooperative mapping efforts, occupied range in New Mexico was estimated to be 8,570 sq km (3,309 sq mi), considerably larger than the conservative estimate used by Davis. One possible reason for the difference in occupied range is that Davis (2006, p. 7) did not consider the known distribution to encompass any portion of Eddy County or southern Lea County. Approximately 59 percent of the historic LPC range in New Mexico is privately held, with the remaining historic and occupied range occurring on lands managed by the BLM, USFS, and New Mexico State Land Office (Davis 2005, p. 12).

In the 1950s, the LPC population was estimated at 40,000 to 50,000 individuals, but by 1968, had declined to an estimated 8,000 to 10,000 individuals (Sands 1968, p. 456). Johnsgard (2002, p. 51) estimated the number of LPC in New Mexico to number fewer than 1,000 individuals by 2001. Similarly, the Sutton Center, based on observations made over a 7 year period, estimate the New Mexico LPC population to number between 1,500-3,000 individuals (Wolfe 2008). Using lek survey data, NMDGF currently estimates the statewide LPC population to be about 4,968 birds (Beauprez 2009, p. 17). The 2009 population estimate represents a 47 percent decrease from the 2008 estimate and is the lowest estimated population since 2004 when the population was estimated to number 5,004 individuals. The dry spring and summer of 2008 and a large hailstorm which occurred in May of 2008 during the peak of nesting season is considered to be at least partially responsible for the observed decline (Beauprez 2009, p. 19).

Roadside listening routes were first established to survey LPC in New Mexico in 1998. Survey routes were located within known occupied and potential range. The original survey boundary included 182 townships which were comprised of habitats consisting of sandy and deep sand range sites supporting shinnery oak and native grasses. In 1999, the survey boundary was adjusted to include 150 townships. The survey boundary was expanded in 2004 to include 382 townships and 80 survey routes (Beauprez 2009, p. 6). The current survey uses 29 standard routes established since 1999, 10 additional routes established in 2003 within the northeastern part of LPC historical range, and 41 routes randomly selected from within the survey boundary townships.

Since initiating the 10 additional northeastern routes in 2003, NMDGF reports that no leks have been detected in northeastern New Mexico. Results provide strong evidence that LPC no longer occupy their historical range within Union, Harding, and portions of northern Quay counties (Beauprez 2009, p. 8). However, a solitary male LPC was observed and photographed in northeastern New Mexico by a local wildlife law enforcement agent in December 2007. Habitat in northeastern New Mexico appears capable of supporting LPC but the lack of any known leks in this region since 2003 suggests LPC populations in northeastern New Mexico, if still present, are very small.

Oklahoma: LPC historically occurred in 22 Oklahoma counties. By 1961, Copelin (1963, p. 53) reported LPC from only 12 counties. By 1979, LPC were verified in eight counties, and the remaining population fragments encompassed an estimated area totaling 2,792 sq km (1,078 sq mi), a decrease of approximately 72 percent since 1944. At present, the ODWC reports LPC continue to persist in eight counties with an estimated occupied range of approximately 950 sq km (367 sq mi). Horton (2000, p. 189) estimated the entire Oklahoma LPC population numbered fewer than 3,000 birds by 2000. A more recent estimate has not been conducted.

Long-term abundance estimates suggest a history of dramatic population fluctuations. Between 1968 and 2001, mean number of males per active lek varied from a high of 16.5 in 1975 to a low of 2.3 in 1995 (ODWC 2007, p. 6). Despite the wide fluctuation in numbers of males per active

lek, the counts demonstrate a downward trend. During the period from 1968 to 1978, the mean number of males per lek averaged 12.5. From 1979 to 1989, the mean number of males per lek averaged 8.5. During the period from 1990 to 2001, the mean number of males per lek averaged 5.1. Beginning with the 2002 survey, male counts at leks were replaced with flush counts, which did not differentiate between the sexes of birds flushed from the surveyed lek (ODWC 2007, pp. 2, 6).

The number of roadside listening routes currently surveyed annually in Oklahoma has varied from 5 to 7 over the last 20 years. Between 1987 and 2008, the estimated density of active leks within occupied habitat varied from a high of 0.12 leks per sq km (0.33 per sq mi) in 1988 to a low of 0.02 leks per sq km (0.05 per sq mi) in 2004 and again in 2006. In 2009, the estimated density of LPC leks in Oklahoma was 0.02 leks per sq km (0.05 per sq mi) down slightly from 2008 (Schoeling 2010, p. 3). Over the last 10 years the density of active leks has varied from a low of 0.02 leks per sq km (0.05 leks per sq mi) in 2004, 2006, and 2009, to a high of 0.03 leks per sq km (0.09 leks per sq mi) in 2005 and 2007 (Schoeling 2010, p. 3).

The ODWC is aware of 96 known historic and currently occupied leks in Oklahoma. During the mid-1990‘s all of these leks were active. Recent survey efforts are lacking for most of these known lek locations and the exact number of currently active or occupied leks in Oklahoma is unknown.

Texas: Systematic surveys to identify Texas counties inhabited by LPC began in 1940 (Henika 1940, p. 4). From the early to (Henika 1940, p. 15; Sullivan et al. 2000) mid 1940’s (Litton 1978, pp. 11-12) to the early 1950’s (Seyffert 2001, pp. 108-112), the range of the LPC in Texas was estimated to encompass all or portions of 34 counties. Species experts considered the occupied range at that time to be a reduction from the pre-settlement range. TPWD reported that LPC were confirmed from portions of 13 counties including Hemphill, and Gray Counties which include the MC NG and Lake Marvin administered by the BK NG.

Annual LPC lek surveys are currently conducted by TPWD in the Northeastern Panhandle (study areas in Gray, Hemphill, and Wheeler counties) region (Lionberger 2009, p. 1). All of these study areas are located on private land and together encompass over 107,211 ac. Annual lek surveys in the Northeastern Panhandle in 2007 found an estimated 4.5 males per with an estimated lek density in 2007 of 0.12 per sq mi, moderately lower than the 0.21 per sq mi reported for 2006. With the exception of 2007, the values for lek density in the Northeastern Panhandle are consistently higher than the values reported for Kansas and much higher than lek densities in Oklahoma.

Summary of State Information: As described above, LPC populations can fluctuate considerably from year to year. Fluctuations in wildlife populations are natural responses to variable weather and habitat conditions. The fluctuations add to the difficulty of evaluating population trends, particularly short-term trends, e.g., periods less than 5 years. Short-term analyses could reveal statistically significant changes from one year to the next, but actually represent a statistically stable population when evaluated over a longer period of time. This situation makes it difficult to interpret very recent declines, such as the decline in 2007, as it is not clear whether it is a natural fluctuation related to drought, or represents a decline for other reasons and will persist. Table 4 summarizes the information described above regarding LPC populations in each state.

**Table 4 Range and current population indices for LPC by state**

| State | Historical Range | Current Range | Current Population Estimates | Current Lek Density (#/km2) 2006 2007 2008 |
|---|---|---|---|---|
| New Mexico | 7 counties 8,645 sq mi | 7 counties 2,200 sq mi | 9,443 (in 2008) | 0.06 0.06 0.08 |
| Oklahoma | 22 counties | 8 counties 367 sq mi | < 3,000 (in 2000) | 0.02 0.02 0.03 |
| Texas | 34 counties (1940's-50's) | 13 counties 2,793 sq mi | 6,077 – 24, 132 (in 2007) | Permian Basin/Western Panhandle 0.29 0.19 NA Northeastern Panhandle 0.08 0.04 NA |

**Status within the Action Area**

Structural habitat fragmentation as a result of vertical structures placed to support oil and gas development, windmills, and invasive trees such as eastern red cedar and black locust has reduced the suitability of large areas of habitat in western Oklahoma including areas on the BC NGs. In addition, human created structures such as fences and power lines produce collision hazards for LPC resulting in direct mortality. A recent concern is the development of wind energy in western Oklahoma including areas on private lands adjacent to the BK NG. The BK NG has not issued any permits for wind energy development.

The Crucial Habitat Assessment Tool (CHAT)[3] categorizes LPC habitat on the BKMC NGs as: Irreplaceable–378 acres (1%); Limiting–17,937 acres (55%); Significant–11,371 acres (35%); and Unknown–3,064 acres (9%). LPC habitat on KRB NGs is categorized as: Unknown–97,536 acres (43%); and Common–129,201 (57%).

The LPC is managed as a Regional Forester's sensitive species and addressed in project specific NEPA documents as a result. Potentially suitable habitat for the LPC occurs on KRB, BK, and MC NGs in Oklahoma, Texas and New Mexico in three primary vegetation types including shinnery oak, mixed-grass prairie and sand sagebrush.

*Mixed-grass prairie:* In 2011, no breeding populations of LPC occurred in the mixed-grass prairie on the BKMC NG, but they are known to occur in close proximity on adjacent or nearby private land. Habitat for the LPC is provided by the diverse structure and composition features of mixed-grass prairie. Tree encroachment on mixed-grass prairie has degraded the habitat for LPC by providing perches for predators such as hawks that prey on LPCs. In addition, utility transmission poles and tall structures from oil and gas sites also provide perches for birds of prey. About 88–94% (9,940–10,620 acres) of the mixed-grass prairie on the BKMC NG is suitable habitat for the LPC.

*Shinnery oak:* In 2011 no LPC breeding populations occurred in shinnery oak habitat on the BKMC NGs but they are known to occur in close proximity on adjacent private land. LPC habitat is provided by the diverse structure and composition features of shinnery oak shrubland. Tree encroachment on shinnery oak vegetation has degraded LPC habitat by providing perches for predators such as hawks that prey on LPCs. In addition, utility transmission poles provide

[3] Southern Great Plains Crucial Habitat Assessment Tool. September, 2011. http://kars.ku.edu/maps/sgpchat/

predator perches and roads fragment habitat as well. About 88−94% (16,630−17,770 acres) of the shinnery oak is suitable habitat.

*Sand sagebrush:* Currently, no LPC breeding population occurs in sand sagebrush on the KRB NGs, but the bird is believed to once have occurred in this habitat on the KRB NGs (BisonM). Tall structures such as utility transmission poles degrade LPC habitat by providing perches for predators such as hawks that prey on LPCs. Sand sagebrush vegetation type has areas that were historically heavily plowed, and species structure and composition were altered to low vegetation. The BTPD colonizes areas with low, early successional stage vegetation. Areal extent of early successional stage sand sagebrush on the KRB is in flux. Wildfire, changes due to BTPD activity, plague within BTPD colonies, and recreational shooting of BTPDs influence the areal extent of sand sagebrush habitat. As of 2008 there were about 22,650 acres of suitable habitat for LPC in sand sagebrush on the KRB.

**Threats**

The following discussion is from the USFWS 2010 LPC species assessment and Listing Factors. Portions of the threats assessment are incorporated by reference into this BA as summarized below.

Because LPC require large areas of intact landscapes of mixed-grass and shrubland habitats, fragmentation and conversion of these habitats have contributed to a significant reduction in the extent of LPC occupied range. Many habitats, once converted to other uses such as cultivated cropland, no longer provide suitable reproductive habitat for the LPC and restoration of ecologically meaningful amounts of converted rangeland is doubtful in the short term. Habitats used by LPC are largely dominated by a diversity of drought tolerant perennial grasses and shrubs. Grazing and fire have always been an ecological driving force within the ecosystems of the Great Plains. Grazing management favorable to persistence of LPC must ensure that a diversity of plants and cover types, particularly shrubs, remain on the landscape and that utilization levels leave sufficient cover in the spring to ensure that LPC nests are adequately concealed from predators. Fire suppression throughout the species range has allowed encroachment of invasive woody plant species such as the Eastern red cedar reducing suitability of large areas of habitat in western Oklahoma. Structural habitat fragmentation has been shown to be detrimental to LPC and forces avoidance or abandonment of otherwise suitable habitats. Structural fragmentation can be a result of vertical structures placed to support oil and gas development, wind energy development, windmills, and invasive trees such as eastern red cedar and black locust. In addition, human created structures such as fences and power lines produce collision hazards for LPC resulting in significant direct mortality.

**Listing Factors**

The following listing factors are taken from 2010 Species Assessment and Listing Priority Form for the LPC

*Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range*. The curtailment of LPC range has occurred throughout large portions of four of the five states occupied by LPC. Estimates reveal that some 86 percent of the historically occupied range has been lost due to a variety of mechanisms including conversion of rangeland to cultivated cropland, energy development, and habitat fragmentation. Rangewide destruction and modification of remaining LPC habitat continues to occur. Within the next few years, the possible conversion of over a million acres of currently enrolled CRP grasslands to cropland and other less

suitable land uses has the potential to destroy or modify some 14 percent of the remaining occupied habitat. Wind energy development with its associated infrastructure development is ongoing and the potential for additional wind energy facilities is substantial within nearly all occupied habitat in all states except New Mexico, where it may impact historical habitat important to linking the New Mexico population to populations to the north. Additionally, the continued loss and degradation of currently occupied habitat in several areas in the form of heavy grazing by livestock, woody plant invasion due to fire suppression, oil and gas development, and fragmentation are rendering portions of the range uninhabitable for the species.

*Factor B. Overutilization for commercial, recreational, scientific, or educational purposes*. Currently, the LPC is classified as a game species in Kansas, New Mexico, Oklahoma, and Texas, although legal harvest is allowed only in Kansas.

Braun et al. (1994, p. 435) called for definitive experiments that evaluate the extent to which hunting is additive at different harvest rates and in different patch sizes. They suggested conservative harvest regimes for small or fragmented grouse populations because fragmentation likely decreases the resilience of populations to harvest. Sufficient information to determine the rate of localized harvest pressure is unavailable and, therefore, the Service cannot determine whether such harvest contributes to local population declines.

An additional activity that has the potential to negatively affect individual LPC populations is the growing occurrence of public and guided bird watching tours of leks during the breeding season. The site-specific impact of recreational observations of LPC at leks is currently unknown. However, disturbance effects are likely to be minimal at the population level if disturbance is avoided by observers remaining in vehicles or blinds until LPC naturally disperse from the lek and observations are confined to a limited number of days and leks. Solitary leks comprised of fewer than ten males are most likely to be affected by repeated recreational disturbance. Research is needed to quantify this potential threat to local populations of LPC.

In summary, it is possible that LPCs harvested through sport hunting might be contributing to a decline of some populations, but the USFWS has no information that shows whether this is actually occurring and no basis on which to estimate whether it might be a problem in some areas. Consequently, USFWS concludes that overutilization is not a basis for concluding that listing the LPC is warranted.

*Factor C. Disease or predation*. There is no information that indicates parasites or disease are causing, or contributing to, the decline of any LPC populations and at this time USFWS has no basis for concluding that disease or parasite loads are threatening any LPC populations.

Prairie Falcon, Northern Harrier, Cooper‘s Hawk, Great-horned Owl, other unspecified raptors, and coyote have been identified as predators of LPC adults and chicks (Davis et al. 1979, pp. 84-85; Merchant 1982, p. 49; Haukos and Broda 1989, pp. 182-183; Giesen 1994a, p. 96). Predators of nests and eggs also include Chihuahuan Raven, striped skunk, ground squirrels, and bullsnakes as well as coyotes and badgers (Davis et al. 1979, p. 51; Giesen 1998, p. 8). LPC predation varies in both form and frequency throughout the year, with raptor predation increasing coincident with lek attendance (Wolfe et al. 2007, p. 100). Patten et al. (2005b, p. 240) stated that male LPC are more vulnerable to predation when exposed during lek displays than they are at other times of the year and that male LPC mortality was chiefly associated with predation. For females, predation during the nesting season would likely have the most significant impact on LPC populations, particularly if that predation resulted in total loss of a particular brood.

Predation is a naturally occurring phenomenon and generally does not pose a risk to wildlife populations unless the populations are extremely small or have an abnormal level of vulnerability to predation. Predation on LPC may be especially important relative to nest success.

Although the USFWS has information on disease in LPC and impacts of predators on LPC at various life stages, there is no information that indicates either disease or predation are causing or contributing to population declines. Consequently, disease and predation do not contribute to a basis for a finding that listing the LPC is warranted.

*Factor D. The inadequacy of existing regulatory mechanisms*. The LPC is classified as a game species, although the legal harvest is now closed in New Mexico, Oklahoma, and Texas. Accordingly, the State wildlife agencies do have the authority to regulate possession of the LPC, set hunting seasons, and issue citations for poaching.

The States in occupied range have incorporated the LPC as a species of conservation concern and management priority in their respective State Wildlife Action Plans. While identification of the LPC as a species of conservation concern does help heighten public awareness, this designation provides no protection from direct take or habitat destruction or alteration.

The BLM's amended RMPA (BLM 2008, pp. 5-31) provides some limited protections for the LPC in New Mexico by reducing the number of drilling locations, decreasing the size of well pads, reducing the number and length of roads, reducing the number of powerlines and pipelines, and implementing best management practices for development and reclamation.

Because only about four percent of the species' overall range occurs on Federal lands, the Service recognizes that the LPC cannot be fully recovered on Federal lands alone. However, no laws or regulations currently protect LPC habitat on private land, aside from State harvest restrictions. Therefore, the Service views decisions regarding the management and leasing of Federal lands and minerals within existing LPC range as important to the future conservation and persistence of the species.

Since 2004, the construction of commercial wind energy projects near and within occupied LPC habitat has raised concerns about the potential negative effects such projects may have on the species, if constructed at large scales in occupied range. As discussed under Factor A, a rapid expansion of transmission lines and associated wind energy development throughout large portions of occupied LPC range is occurring. Because most wind development activities are privately funded and are occurring on private land, wind energy siting and development and operation falls outside the purview of the National Environmental Policy Act of 1969 (NEPA) and other Federal conservation statues and regulatory processes. As a result, little opportunity for timely and appropriate environmental review and consultation by Federal, State, and local conservation entities exists.

The current lack of regulatory oversight and public notice requirements for the purchase of wind rights and construction of wind generation and related transmission facilities is a concern. Specifically, the Service is unaware of any State or Federal mechanisms that require potential wind energy producers to disclose the location, size, and anticipated construction date for pending projects or require analysis under the provisions of the NEPA. Lacking the ability to obtain pertinent siting information or analyze alternative siting locations, neither the Service nor State wildlife agencies have the ability to accurately influence the size and or timing of wind generation construction activities within occupied LPC habitat.

In conclusion, most occupied LPC habitat occurs on private land, where State wildlife agencies have little authority to protect LPC or facilitate and monitor management of LPC habitat beyond regulating recreational harvest. Because most LPC habitat destruction and modification on private land occurs through otherwise lawful activities such as agricultural conversion, livestock grazing, energy development, and fire exclusion, few if any regulatory mechanisms are in place to substantially alter human land uses at a sufficient scale to protect LPC populations and their habitat. While almost no regulatory protection is in place for the species, regulatory incentives, in the form of county, State, and national legislative actions, have been created to facilitate the expansion of structural fragmentation of occupied LPC habitat, such as from oil, gas, and wind energy development. For the remaining four percent of occupied habitat currently under Federal management, habitat quality depends primarily on factors related to multiple use mandates, such as livestock grazing and oil, gas, and wind power development activities. Because prior leasing commitments and management decisions on the majority of occupied parcels of Federal land offer little flexibility for reversal, any new regulatory protection for uncommitted land units are unlikely to achieve substantial benefits for or recovery of the species in the short term.

USFWS notes also that the existing regulatory mechanisms at the Federal and State level have not been sufficient to preclude the decline of the species, and that under existing mechanisms the present and threatened destruction, modification, and curtailment of LPC habitat and range (as described in Factor A above) is ongoing. Consequently, USFWS concludes that the inadequacy of existing regulatory mechanisms contributes to a basis for concluding that listing the LPC is warranted.

*Factor E. Other natural or manmade factors affecting its continued existence*. Drought may impact LPC through its effect on seasonal growth of vegetation necessary to provide nesting and roosting cover, food, and opportunity for escape from predators (Merchant 1982, p. 51; Peterson and Silvy 1994, p. 227; Morrow et al. 1996, pp. 596-597). Although drought conditions are unlikely to be the sole causative factor in long-term LPC population declines, the effects of drought on population growth rate may exacerbate the extirpation risk to small, fragmented populations.

In summary, threats to LPC survival from natural and manmade factors include drought, pheasant nest parasitism and harassment, herbicide use, collision mortality, and small population size. All of these factors can affect habitat quality and reduce LPC survival and reproductive success. The long term effect of hybridization with greater prairie-chickens is unknown, but is likely symptomatic of weakened populations coupled with human alteration of historic landscapes. The application of shrub-killing herbicides continues throughout the species' range. The effects of drought and of human-caused impacts such as deaths due to collisions (e.g., as a result of fencing) collectively are contributing to the basis for concluding that listing the LPC is warranted. Other factors such as disease and predation, hunting, and wildlife viewing are not currently considered detrimental to LPC.

**Effects Analysis**

There are no known breeding populations on the KRB, BK, and MC NG, but the species does occupy adjacent habitat to BK NG. The Proposed Plan has many plan components designed specifically to address the threats mentioned above including:

- Listing Factor A, the loss and degradation of habitat from woody plant invasion due to fire suppression, oil and gas development, and fragmentation

- Listing Factor B, the inadequacy of existing regulatory mechanisms contributes to the decline of LPC
- Listing Factor E, the natural occurrence of drought and death due to collisions are contributing to the decline of LPC

In general, the implementation of plan components related to minerals-energy development, recreation, wildlife habitat improvement and grazing management should result in positive effects to the LPC by directly improving habitat suitability and improving the overall health and diversity of ecological conditions across the landscape. The Proposed Plan has specific components for enhancement of LPC habitat that are in listed in Table 5 and described in effects analysis summaries. Furthermore, plan components addressing resource damage caused by roads and recreational activities, such as OHV, were also considered in the threats analysis and addressed by the 2012 Travel Management Decision and Motor Vehicle Use Map (MVUM) to be implemented in the Fall, 2012. The Proposed Plan supports the Travel Management decision and MVUM. On all vegetation types of habitat, LPC mortality caused by collision with fences would be reduced as a result of a plan objective of marking fences with visible plastic tabs in suitable LPC habitat.

*Mixed-grass prairie:* The mixed-grass prairie is currently in low departure from reference condition for vegetation structure. The Proposed Plan would achieve the following outcomes. Desired vegetation structure and species composition of the mixed-grass prairie across the landscape would enhance habitat by reducing the presence of undesirable invasive trees. The enhanced vegetation structure and species composition of mixed-grass prairie would transition potential LPC habitat to suitable habitat.

The mixed-grass desired condition species composition would increase vegetation structure and height relationships necessary for ground nesting bird cover and brood rearing habitat. Small areas of short structured herbaceous vegetation or patches of bare ground would increase for LPC leks and courtship areas. Small areas or patches of bare ground would become more available that provide wildlife travel corridors, escape routes, and annual plant germination sites for wildlife foraging habitat.

*Shinnery Oak:* Shinnery oak vegetation is currently in low departure from reference condition for vegetation structure. The Proposed Plan would direct undesirable tree removal, result in transition of potential habitat to suitable habitat, and would provide a diversity of structural vegetative stages for LPC. The Proposed Plan has desired conditions for vegetation structure and species composition that would improve ground-nesting bird cover and LPC brood-rearing habitat and would provide wildlife travel corridors and escape routes within the shrub cover. Small areas of short herbaceous vegetation or patches of bare ground would be available for LPC leks and courtship areas.

*Sand sagebrush:* Sand sagebrush is currently is in low departure from reference condition for structure. The Proposed Plan would the move vegetation type toward desired vegetation structure and species composition, accomplished through well-defined targets. The outcome would be of benefit to habitat for wildlife native to this vegetation type. A diversity of structural vegetative stages for the LPC would be produced, including leks and courtship areas, and would result in more development of corridors and escape routes for general wildlife native to this vegetation type, benefitting numerous species.

**Plan Components**

The Proposed Plan has components for resource areas that affect LPC over the life of the Plan. Desired conditions, objectives, and guidelines by resources area are listed in Appendix A of this document. The resource area and number coded plan components are described in detail there.

Overall, the Proposed Plan includes plan components which, in general, are positive for the LPC. Many of these plan components direct the NG to manage preferentially for ESA listed species. Furthermore, many of the plan components are designed to improve the overall health and diversity of ecological conditions across the landscape.

Specific plan components were developed for LPC as a result of viability risks that were determined during species risk assessment preceding plan development.

The following table lists number coded plan components and provides an Effects Analysis Summary that shows how the Proposed Plan will promote protection and recovery of the LPC.

**Table 5 Lesser Prairie-chicken Effects Summary**

| Lesser Prairie-chicken | | |
|---|---|---|
| Resource Program | Plan Component Code # | Effects Analysis Summary |
| Grassland-wide | | |
| Motorized Recreation and Roads and Access | 1-2, 4-5 | Impacts to potential habitat for the LPC will be minimized through motorized-route designations. Roads determined to be in important LPC habitat could be relocated or closed to improve habitat suitability. |
| Land Adjustments | 6-7 | Habitats determined to be important to the LPC may be acquired if there is a willing seller. Land acquisition would reduce habitat fragmentation since many of the adjacent private lands are under cultivation. |
| Minerals and Energy Development | 8-9 | Oil and gas will be developed to minimize impacts to natural resources including the LPC. |
| Special Uses | 11 | The location of new, large linear infrastructure such as power lines has minimal effects on wildlife and minimized habitat fragmentation. |
| Wind Energy Development | 12 | LPC will be considered and recommendations from USFWS will be reviewed prior to approving wind energy development proposals to minimize impacts. Wind energy development poses a threat the LPC. This species avoids areas with large vertical structures such as wind turbines. Development of wind energy could reduce habitat suitability for LPC over large areas of the National Grasslands. |
| Livestock Use | 13, 15 | Livestock grazing will be managed to provide for the foraging and cover needs of the LPC through retention of adequate residual ground cover. Livestock trampling of nests is not likely since there are no known breeding areas on the Grasslands. |
| Wildland Urban Interface and Wildland Fire | 16-17 | Fire will be used to meet resource objectives including cover and forage improvement for the LPC. |
| General Ecological | 18, 19, 21-23 | These plan components and recovery plans promote native ecosystems, species richness and diversity, habitat linkages, and natural processes which directly benefit forage and cover habitat for the LPC. Livestock grazing and planned fire would provide disturbance to vegetation that evolved under natural disturbance regimes, benefiting all vegetation structure and composition makeup and controlling some invasive and undesirable species. The structure and composition makeup would improve habitat thereby benefiting LPC. |

| Lesser Prairie-chicken | | |
|---|---|---|
| Climate Change | 24 | Adaptive management and ecosystem resiliency will allow shifting of terrestrial and aquatic plant communities across the landscape which may indirectly benefit the LPC. |
| Invasive Plants and Animal Species | 36-39 | Best management practices (based on best available science) that prevent establishment of noxious weeds on the Grasslands would protect and enhance LPC habitat. |
| Black Kettle | | |
| Minerals and Energy Development | 40 | Oil and gas will be developed to minimize impacts to natural resources including the LPC. |
| Wildlife Habitat Improvement | 41-44 | Water availability would be maintained or enhanced. New fences would be constructed to reduce collision hazard for LPC reducing direct mortality. |
| Invasive Plants and Animal Species | 45-47 | Invasive trees would be removed increasing habitat potential in the shinnery oak and mixed-grass prairie habitat. Predation of young and eggs by feral hogs would be reduced, thereby benefitting the LPC. |
| Mixed-grass Prairie Vegetation | 48-58 | These plan components promote the mixed-grass prairie native ecosystems, species richness and diversity, habitat linkages, and natural processes which directly benefit forage and cover habitat for the LPC. Livestock grazing and planned fire would provide disturbance to vegetation that evolved under natural disturbance regimes, benefiting all vegetation structure and composition makeup and controlling some invasive and undesirable species. The structure and composition makeup would improve habitat, thereby benefiting LPC. |
| Shinnery Oak Vegetation and Inclusion of Historically Deep Plowed Areas | 59-67 | These plan components promote the shinnery oak native ecosystems, species richness and diversity, habitat linkages, and natural processes which directly benefit forage and cover habitat for the LPC. Livestock grazing and planned fire would provide disturbance to vegetation that evolved under natural disturbance regimes, benefiting all vegetation structure and composition makeup and controlling some invasive and undesirable species. The structure and composition makeup would improve habitat, thereby benefiting LPC. |
| Kiowa Rita Blanca | | |
| Sand Sagebrush | 68-74 | These plan components promote sand sagebrush native ecosystems, species richness and diversity, habitat linkages, and natural processes which directly benefit forage and cover habitat for the LPC. Livestock grazing and planned fire would provide disturbance to vegetation that evolved under natural disturbance regimes, benefiting all vegetation structure and composition makeup and controlling some invasive and undesirable species. The structure and composition makeup would improve habitat, thereby benefiting LPC. |

**Direct Effects**

The Proposed Plan provides a programmatic framework that guides site-specific actions but does not authorize, fund, or carry out any project or activity. Because the land management plan does not authorize or mandate any site-specific activities or ground-disturbing actions, there can be no direct effects. However, there may be implications or longer term environmental consequences of managing the grasslands under this programmatic framework.

After the Plan is implemented, all site-specific activities must conform to the programmatic framework set up in the Proposed Plan and they must meet site-specific NEPA and ESA requirements.

**Indirect Effects**

The Proposed Plan has components developed that would indirectly benefit the LPC through desired conditions designed to improve conditions over time. Specifically the numerically coded components 8, 9, 11, 12, and 40 for minerals/energy development, numbers 13 and 15 for grazing management, and numbers 48 through 74 for vegetation management should result in positive effects to the LPC by restoring and protecting habitat.

**Critical Habitat:** There is no critical habitat designated for the LPC on the Grasslands.

**Cumulative Effects:** Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological assessment. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

The administrative boundaries of the Grasslands encompass units that are not contiguously adjoined tracts. Private, State, and County managed lands are in the action area. Activities from these entities that have potential to affect LPC would be those activities that fragment habitat and alter vegetation structure such as land use change, agriculture practices or vegetation management.

Conversion of grassland to cultivated land on private lands would have cumulative environmental consequences that would likely be as follows:

Lesser Prairie-chicken may be displaced from grassland vegetation types on private land that have been altered or converted to cropland and may be forced to compete for limited territories available in the vegetation types on the Grasslands, or leave the area altogether. Overall, habitat across the landscape, including the Grasslands, will become more fragmented for the LPC.

Additional food sources from crop residue on adjacent private land would be available and beneficial for LPC.

There would be an increased probability of invasive species colonizing within the vegetation types of the Grasslands from seed sources originating from adjacent private lands.

*Mixed-grass and Shinnery oak*. There are about 109 linear miles of shelterbelts on non-Federal land within a mile of the BK NG border.

Off-Grasslands shelterbelts could negate benefits from of undesirable native and nonnative invasive trees on the Grasslands with regard to perching and nesting habitat for raptors.

Some private ownership agriculture lands adjacent to the Grasslands have been undergoing mechanical, manual, and herbicide treatment for noxious invasive species for many years. This has been done to maintain the agriculture value and other property values. Treatment of invasive plants on adjacent lands is expected to have a positive benefit to LPC habitat. The Grasslands have a one-half mile weed treatment zone adjacent to the Grassland units as well.

**Determination of Effects (Species) and Summary**

The primary threat to the LPC is habitat fragmentation. Conversion of these habitats has contributed to a significant reduction in the extent of LPC occupied range. Many habitats, once converted to other uses such as cultivated cropland, no longer provide suitable reproductive habitat for the LPC. Current management as well as the 56 plan components described in Table 5 above provide habitat necessary for the LPC. Although habitat fragmentation and structural intrusions limit occupancy of the NGs, the Districts are working to remove trees and other tall structural barriers and maintain habitat for future occupancy. Management direction for the NG is likely to result in improved habitat conditions, minimize or eliminate the likelihood of incidental take, and support the recovery of the LPC. Therefore, implementation of the Proposed Plan is **Not Likely to Jeopardize** the continued existence of the LPC. If listed under the ESA, implementation of the Proposed Plan **"May Affect**, but is **Not Likely to Adversely Affect"** the LPC.

## Conclusion and Determination

The USFS analyzed the effects of the Proposed Plan and desired conditions on the listed and candidate species in the action area. However, the USFS recognizes that the potential exists, although unlikely, that adverse effects may be identified during the implementation of site-specific activities in the action area. The USFS believes that if this does occur in the future, it should not necessarily trigger a re-initiation of ESA consultation on the Proposed Plan.

**Arkansas River Shiner *(Notropis girardi)* including designated critical habitat**

Based on the analysis of the plan components relating to the ARS, the implementation of the Proposed Plan will have will have insignificant and/or discountable effects to the ARS because:

- USFS has limited ownership of lands that drain into the overall range of the species, and
- Plan Components promote protection and recovery of listed species.

The Proposed Plan will have discountable indirect effects to CH, because:

- Critical habitat has been removed from areas in unit 1a and 1b that occurred adjacent to or drained into previously designated critical habitat
- USFS has limited ownership and manages 1,180 acres of headwaters of watersheds that drain into tributaries that are connected to occupied habitat, which is an insignificant amount of the hydrological basin that contributes to ARS occupied habitat.
- Plan Components promote protection and recovery of listed species as well as riparian, wetland and wildlife values and habitat.

Therefore, the USFS concludes that the Proposed Plan **"May Affect, but is Not Likely to Adversely Affect"** the ARS and its designated critical habitat.

**Interior Least Tern**

Based on the analysis of the plan components relating to the least tern, the implementation of the Proposed Plan will have insignificant and/or discountable effects to the least tern because

- Under the direction of the Proposed Plan there are no activities proposed to construct reservoirs or ponds on the Canadian River or its tributaries.
- Plan Components promote protection and recovery of listed species.

- While recreational activities on Grasslands lakes could disturb foraging terns during the summer months, the type and intensity of recreational activities suggests that these effects would be insignificant and discountable to the species foraging activity.
- The Proposed Plan has standards for oil and gas leasing that controls surface use, and open pits are not allowed, which could attract foraging least terns.

Therefore, this rationale supports the conclusion that the implementation of the Proposed Plan **"May Affect**, but is **Not Likely to Adversely Affect"** the least tern.

**Lesser Prairie-chicken**

The Proposed Plan has desired conditions, objectives, and guidelines that would likely result in improved habitat conditions for LPC on mixed-grass prairie, shinnery oak, and sand sagebrush vegetation types.

- The Proposed Plan would minimize the likelihood or magnitude of direct and indirect adverse effects, with many plan components developed specifically to improve habitat and minimize the likelihood of adverse effects and support the recovery of the LPC.
- Although habitat fragmentation and structural intrusions limit occupancy of LPC on the Grasslands, the Proposed Plan would remove trees and improve habitat through vegetation composition and structure goals designed for potential future LPC occupancy.
- The relative contribution of the areas managed by the Grasslands is very small compared to the range of the species. Certainly, the Grasslands can contribute to the recovery of the species. However, recovery of the species is highly dependent upon actions carried out on the landscape that is not managed by the Grasslands.

Therefore, implementation of the Proposed Plan is **Not Likely to Jeopardize** the continued existence of the LPC. If listed under the ESA, implementation of the Proposed Plan **"May Affect**, but is **Not Likely to Adversely Affect"** the LPC.

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## Maps

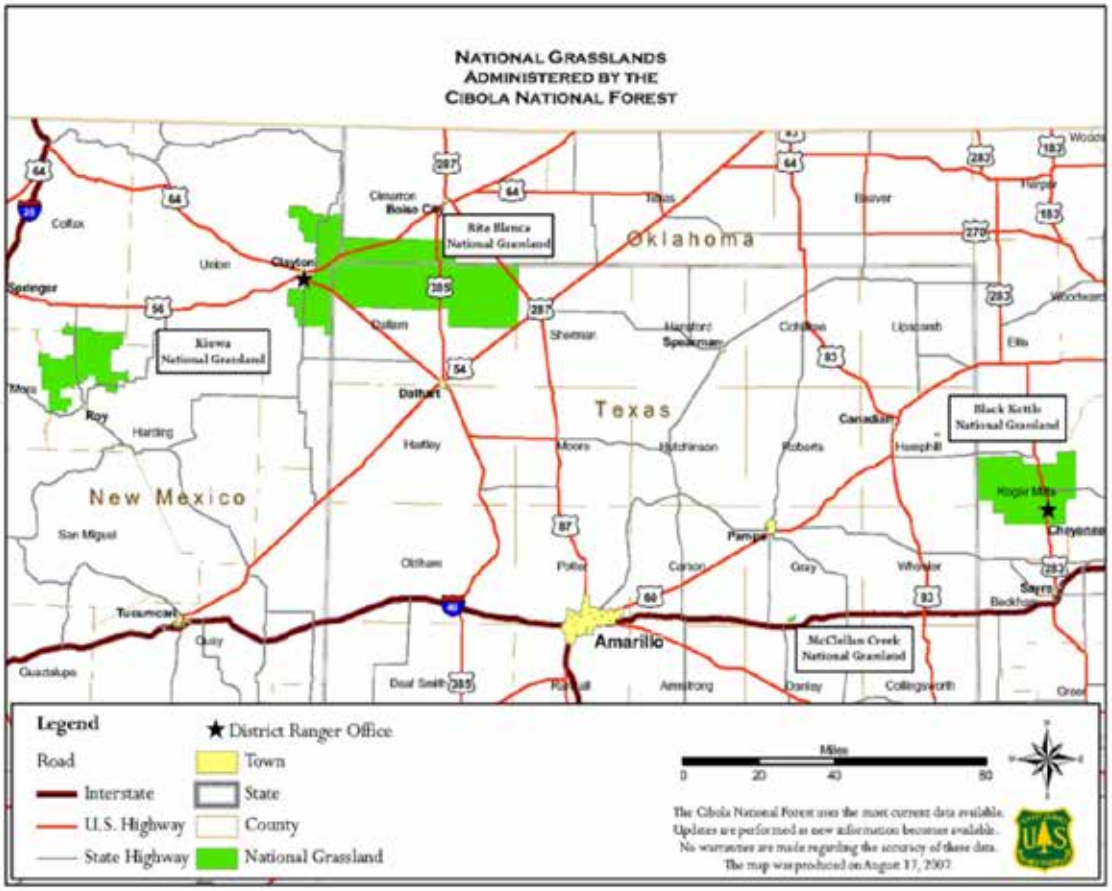


**Figure 1 Vicinity Map of the Action Area**

# Appendix A Plan Components Numerical Code Resource/Species/Category Listing

**Table 6 Plan Components Numerical Code Resource/Species/Category Listings**

| Plan Components Numerical Code Resource/Species/Category Listing | | | |
|---|---|---|---|
| **Code #** | **Species** | **Resource Area** | **Plan Components Desired Condition (DC), Objective (O), Standard (S), and Guideline (G)** |
| **Grasslands Wide** | | | |
| 1 | All Species | Motorized Recreation | DC: The designated road and trail system accommodates various classes of motor vehicles. The system provides a safe experience that minimizes impacts to soil, water, vegetation, wildlife, scenic, and heritage resources. |
| 2 | All Species | Motorized Recreation | DC: The designated system reduces the impact of roads and trails to resource values by prohibiting unauthorized road development and correcting or mitigating poorly-located system roads. Where OHV opportunities are provided, routes occur in areas where natural resource impacts can be minimized. Conflicts with other uses are minimized. |
| 3 | All species | Motorized Recreation | G: Motorized vehicles should be restricted from riparian areas to protect vegetation, water quality and streambanks. |
| 4 | All Species | Motorized Recreation | G: When found to impact Federal Threatened and Endangered Species, existing road routes should be evaluated for closure to protect important species habitats; alternative travel routes should be developed where feasible that do not impact listed species. |
| 5 | All Species | Roads and Access | DC: Pursue decommissioning of all roads no longer needed for the administration of National Forest System lands. |
| 6 | All Species | Lands Adjustments | DC: Lands acquired from willing sellers have qualities that improve the agency's ability to carry out its mission on the National Grasslands. The location or condition of the parcel being acquired contributes to the consolidation of the ownership pattern of the National Grasslands, provides necessary road or trail access to National Forest System (NFS) lands, has unique or high-quality natural or cultural resources, improves the management of a designated special area, contains important plant or animal habitats, contains or influences wetlands, floodplains, or riparian areas, or provides opportunities to rehabilitate or stabilize adjacent NFS lands. |
| 7 | All Species | Lands Adjustments | DC: Grasslands units available for exchange or purchase are generally isolated parcels and lack unique natural and cultural resources. |
| 8 | All Species | Minerals and Energy Development | DC: Development of the oil and gas resource minimizes impacts to other resources, whenever possible. Oil and gas drilling sites are in compliance with their Surface Use Plan of Operation, Application for Permit to Drill, Conditions of Approval, and best management practices. Erosion control measures prevent excessive erosion from occurring off-site. Roads are the minimum width necessary for safety and site protection |
| 9 | All Species | Minerals and Energy Development | DC: The Grasslands provide common minerals that are extracted for a public benefit without substantial harm to natural and cultural resources. |
| 10 | Interior Least Tern | Standards for Oil and Gas Leasing | S: No surface occupancy is allowed within 300 feet of riparian areas or wetlands, as determined by Grassland staff, and/or by on-site inspection by the Grassland Authorized Officer, and/or where the Forest's Terrestrial Ecosystem Survey and vegetation data indicate riparian or wetland conditions (hydrology, hydrophytic plants, hydric soil), including active floodplains. |
| 11 | All Species | Special Uses | DC: The location of new, large linear infrastructure such as power lines has minimal effects on wildlife and minimized habitat fragmentation. |
| 12 | Lesser Prairie-Chicken | Wind Energy Development | Non-Plan Component Management Approach: U.S. Fish and Wildlife Service Wind Turbine Guidelines Advisory Committee recommendations will provide managers advice and recommendations on developing effective measures to avoid or minimize impacts to wildlife and their habitats related to land-based wind energy projects. |
| 13 | All Species | Livestock Use | DC: Livestock use provides for conditions that support the sustainability of diverse, healthy herbaceous and woody plant communities and animal populations. |
| 14 | Least Tern | Livestock Use | DC: Wetlands do not suffer from trampling and compaction or excessive sediment deposition. |

**Plan Components Numerical Code Resource/Species/Category Listing**

| Code # | Species | Resource Area | Plan Components<br>Desired Condition (DC), Objective (O), Standard (S), and Guideline (G) |
|---|---|---|---|
| | and ARS | | |
| 15 | All Species | Livestock Use | G: Permitted grazing should allow for residual ground cover levels to provide for plant physiological needs, soil protection, wildlife habitat, and vegetation desired conditions. |
| 16 | All Species | Wildland-Urban Interface and Wildland Fire | O: Annually, treat by mechanical methods, thinning, with planned ignitions or other means 2,000 to 3,000 acres in WUI areas to reduce fire hazard to communities and the National Grasslands. |
| 17 | All Species | Wildland-Urban Interface and Wildland Fire | G: Planned ignitions should create conditions that enable future unplanned ignitions to mimic their historical role or to serve as a tool to achieve resource objectives. |
| 18 | All Species | General Ecological | DC: Native ecosystems are present and sustainable across the Grasslands and are able to support a full complement of native species. There is a natural and nearly complete assemblage of native plants and animals, including important game species, distributed across the Grasslands. |
| 19 | All Species | General Ecological | DC: Natural corridors link habitats within Grassland units. Terrestrial ecosystems are resilient to disturbance and tolerate the effects of, and therefore benefit from, wildland fire in a near-natural fire regime. Natural processes occur within the vegetative communities that enhance species richness and diversity. |
| 20 | Interior Least Tern and ARS | General Ecological | DC: All natural aquatic habitats benefit and encourage populations of native species. Native species persist or become reestablished. Aquatic habitat for, ARS. |
| 21 | All Species | General Ecological | DC: Forage use by grazing ungulates contributes to a diversity of healthy herbaceous and woody plant communities and supports continued viability of wildlife populations. |
| 22 | All Species | General Ecological | G: Native seed mixes and plant species should be used for rehabilitation of sites, except in developed recreation sites, where non-reproducing, nonnative trees may be used to enhance shade and other aspects of the recreation experience. |
| 23 | All Species | General Ecological | G: Activities occurring within Federally-listed species habitat should apply habitat management objectives and species protection measures from approved recovery plans. |
| 24 | All Species | Climate Change | DC: Grasslands ecosystems are resilient to changing natural disturbance regimes as a result of climate change (e.g., drought, wind, fire, insects, and pathogens), allowing for shifting of terrestrial and aquatic plant communities, and associated habitats across the landscape. |
| 25 | All Species | Soil, Water, Air | DC: Soil conditions are satisfactory on the Grasslands. Areas above natural levels of soil loss rarely occur or are stabilized in the long term, with the exception of prairie dog towns. |
| 26 | Interior Least Tern and ARS | Soil, Water, Air | G: Soil disturbing activities should be designed to prevent sediment discharge into streams, lakes, and/or wetlands and to prevent soil loss. |
| 27 | Interior Least Tern and ARS | Water, Watershed, Perennial Streams, Reservoirs, Lakes, | DC: Watersheds are characterized by high infiltration rates, low soil compaction, and minimal overland flow. Within the capability of the Grasslands, streams, springs, playa lakes, wetlands, and aquifers sustain water quantity and quality. Springs, wetlands, streams and lakes are at proper functioning condition[4], and streams and lakes exhibiting unacceptable bank erosion are healed or healing, The miles of roads or trails contributing to increased sediment load are minimized. |

[4]Proper functioning condition – A condition when adequate vegetation, landform, or large woody debris is present to: dissipate stream energy associated with high waterflow, thereby reducing erosion and improving water quality; filter sediment, capture bedload, and aid floodplain development; improve flood-water retention and groundwater recharge; develop root masses that stabilize streambanks against cutting action; develop diverse ponding and channel characteristics to provide the habitat and the water depth, duration, and temperature necessary for fish production, waterfowl breeding, and other uses, and support greater diversity.

Page 2

National Grasslands Biological Assessment

| Plan Components Numerical Code Resource/Species/Category Listing | | | |
|---|---|---|---|
| **Code #** | **Species** | **Resource Area** | **Plan Components Desired Condition (DC), Objective (O), Standard (S), and Guideline (G)** |
| | | Wetlands, Ponds, and Playa Lakes | |
| 28 | Interior Least Tern and ARS | Water, Watershed Etc. | DC: In perennial riverine habitats, native woody and herbaceous vegetation provide streambank stabilization and channel stability (such as bank cover and stream shading). Fluvial processes and flooding regimes sustain riparian and aquatic wildlife and plant species across the Grasslands. Sediment input to streams due to human activities (e.g., road building, recreation, mineral/gas exploration, fuelwood harvest, and riparian grazing) is minimized. |
| 29 | Interior Least Tern and ARS | Water, Watershed Etc. | DC: For both herbaceous and woody riparian areas, stream characteristics (including vegetation, woody debris, geomorphology, and hydrology) are sufficient to: Dissipate stream energy associated with high water flows, thereby reducing erosion and improving water quality, capture and store sediment and aid in vertical channel stability and flood plain development, improve flood-water retention and ground water recharge, develop root masses that stabilize streambanks against cutting action, and support biodiversity. |
| 30 | Interior Least Tern and ARS | Water, Watershed Etc. | G: Fish stocking should be conducted with desirable native and nonnative species. |
| 31 | Interior Least Tern and ARS | Water, Watershed Etc. | G: Public information, user education, and appropriate management tools should be used to limit the spread of nonnative exotics in aquatic systems. |
| 32 | Interior Least Tern and ARS | Water, Watershed Etc. | G: Springs and natural water sources should be managed for the maintenance of riparian habitat and water quality. |
| 33 | Interior Least Tern and ARS | Water, Watershed Etc. | G: OHV use should be restricted or damage mitigated in aquatic systems in order to protect vegetation, water quality, and streambanks. |
| 34 | Interior Least Tern and ARS | Water, Watershed Etc. | G: Designated motorized vehicle stream crossings should maintain or provide for aquatic passage. |
| 35 | Interior Least Tern and ARS | Invasive Plants and Animals | DC: Through information and awareness efforts, introduction of undesirable, predatory, invasive, nonnative fish and amphibians is minimized (except where they are already present in the Black Kettle and McClellan Creek lakes and in the Canadian River. |
| 36 | All Species | Invasive Plants and Animals | DC: The feral hog population is diminishing or nonexistent. |
| 37 | All Species | Invasive Plants and Animals | O: Over the next 15 years after plan approval, use chemical or mechanical treatments, prescribed fire or other tools to treat 90 to 100% of known populations of identified noxious weeds and invasive plant species, both native and nonnative. |
| 38 | All Species | Invasive Plants and Animals | G: Only native species or sterile hybrids should be used in reclamation or stabilization activities on all vegetation types. |
| 39 | All Species | Invasive Plants and Animals | G: Best management practices (based on best available science) that prevent establishment of noxious weeds on the Grasslands should be incorporated in permit modifications, contracts, scopes of work, annual operating instructions, and agency activities. |
| **Black Kettle and McClellan Creek Management Area** | | | |
| 40 | Interior Least Tern and ARS | Minerals and Energy Development -Oil and Gas Leasing Standards | S: No surface occupancy of Lake McClellan is allowed within 500 feet of the high water level, and for Lake Marvin, within 500 feet of the high water mark. |

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National Grasslands Biological Assessment

**Plan Components Numerical Code Resource/Species/Category Listing**

| Code # | Species | Resource Area | Plan Components<br>Desired Condition (DC), Objective (O), Standard (S), and Guideline (G) |
|---|---|---|---|
| 41 | Lesser Prairie-chicken | Wildlife Habitat Improvement | DC: Existing and new wildlife habitat structural improvements (such as rainfall catchments, fenced grazing exclosures, constructed fishing lakes, windmill overflow pits, and constructed ponds/dirt tanks) are functional. Water developments, such as drink tanks, provide access and escape avenues for wildlife and are accessible all year long. |
| 42 | Lesser Prairie-chicken | Wildlife Habitat Improvement | G: Developed water sources should be equipped with wildlife escape structures. |
| 43 | Lesser Prairie-chicken | Wildlife Habitat Improvement | G: Windmills at water wells should be kept running all year long when water availability and mechanical function permit, for wildlife benefit. |
| 44 | Lesser Prairie-chicken | Wildlife Habitat Improvement | G: New fences should minimize adverse effects upon the free movement of wildlife. |
| 45 | Lesser Prairie-chicken | Invasive Plants and Animals | DC: Invasive and/or undesirable trees[5] such as black locust, Siberian elm, and eastern redcedar, among others, are not present where they could negatively impact desired vegetation composition and structure. |
| 46 | Lesser Prairie-chicken | Invasive Plants and Animals | DC: Historical burning regimes occur during the growing season that thin canopy cover and increase plant diversity. |
| 47 | Lesser Prairie-chicken | Invasive Plants and Animals | G: Suitable habitat determination (based on best available science for the life history of the Lesser Prairie-chicken) should be made on shinnery oak and mixed grass vegetation types on the Black Kettle Grasslands, prior to removal of black locust tree encroachment. |
| 48 | Lesser Prairie-chicken | Mixed-Grass Prairie Vegetation | DC: Mixed grass prairie is characterized by grasses and forbs without the presence of trees. The structure and composition of the mixed-grass prairie across landscape maintains the treeless reference condition of the mixed-grass prairie Ecological Indicator. |
| 49 | Lesser Prairie-chicken | Mixed-Grass Prairie Vegetation | DC: Mixed grass prairie on the Black Kettle and McClellan Creek National Grasslands is a warm-season grass-dominated ecosystem. The codominant grasses include little bluestem, sideoats grama, smaller proportions of big bluestem, and blue grama. Forbs are present but are less abundant than grasses and include western ragweed, annual broom weed, tarragon, and baby aster, all providing food for wildlife species. |
| 50 | Lesser Prairie-chicken | Mixed-Grass Prairie Vegetation | DC: The mixed grass species composition provides vegetation structure and height relationships necessary for ground nesting bird cover and brood rearing habitat. Small areas of short structured herbaceous vegetation or patches of bare ground are available for Lesser Prairie-chicken leks and courtship areas. Small areas or patches of bare ground are present that provide wildlife travel corridors, escape routes, and annual plant germination sites for wildlife foraging habitat. |
| 51 | Lesser Prairie-chicken | Mixed-Grass Prairie Vegetation | DC: Shrub species component is typically no less than 5% or more than 25% of the total mixed grass ground cover. Species composition includes fragrant mimosa, skunkbush sumac, smooth sumac, and inland New Jersey tea, all contributing to retaining or improving foraging and escape habitat for Lesser Prairie-chicken and Northern Bobwhite. |
| 52 | Lesser Prairie-chicken | Mixed-Grass Prairie Vegetation | DC: Disturbance processes (including drought, fire, and grazing) occur on the landscape at varying intervals and intensities, determined by climatic conditions and vegetative density respectively. Prescribed fire intervals occur on a 3 to 10-year regime. |
| 53 | Lesser Prairie-chicken | Mixed-Grass Prairie Vegetation | O: Using prescribed fire, reintroduce fire to 50 to 75% of the mixed grass over the next 15 years after plan approval. |

[5]Undesirable trees are those trees that either did not occur historicallywithin a Grasslands' vegetation type or had a much reduced presence, and their presence conflicts with other resource objectives on the Grasslands.

| Plan Components Numerical Code Resource/Species/Category Listing | | | |
|---|---|---|---|
| **Code #** | **Species** | **Resource Area** | **Plan Components Desired Condition (DC), Objective (O), Standard (S), and Guideline (G)** |
| 54 | Lesser Prairie-chicken | Mixed-Grass Prairie Vegetation | O: Mechanically or with prescribed fire, remove all undesirable trees on the mixed-grass prairie over the next 15 years after plan approval. |
| 55 | Lesser Prairie-chicken | Mixed-Grass Prairie Vegetation | O: Over the next 15 years after plan approval, retain shrubby cover across the landscape in patches that are no less than 5% or more than 25% of the total mixed grass area. |
| 56 | Lesser Prairie-chicken | Mixed-Grass Prairie Vegetation | O: Within 10 years of plan approval, mark 25% to 50% of fences in suitable Lesser Prairie-chicken habitat to minimize collisions of the bird with fences. |
| 57 | Lesser Prairie-chicken | Mixed-Grass Prairie Vegetation | G: Trees in upland settings within landscapes suitable for Lesser Prairie-chicken habitat should be targeted for eradication. |
| 58 | Lesser Prairie-chicken | Mixed-Grass Prairie Vegetation | G: Prescribed fire should have a recurrence interval of 5 to 15 years, to encourage forb production; timing should consider adverse consequences to ground nesting birds. |
| 59 | Lesser Prairie-chicken | Shinnery Oak Vegetation and Inclusion of Historically Deep Plowed Areas | DC: Shinnery oak is characterized by shrubs, grasses, and forb species without the presence of trees. The structure and composition of the shinnery oak across landscape maintains the treeless reference condition structure of the shinnery oak. |
| 60 | Lesser Prairie-chicken | Shinnery Oak Vegetation and Inclusion of Historically Deep Plowed Areas | DC: The shinnery oak vegetation is a grass-dominated ecosystem with a shinnery oak shrub understory. The overstory is made up of warm season herbaceous species. Most of the warm season grass species have a dominant position in regard to canopy vertical structure. In a less dominant vertical structure position are shrubs and woody plants. Forbs are located within this vegetation type and are found in lower quantities than herbaceous grasses or woody shrubs. There are few trees found within this vegetation type, although small clusters or motts of shinnery oak hybrids ranging in height from tall shrub to 20 feet or more may be found scattered throughout. |
| 61 | Lesser Prairie-chicken | Shinnery Oak Vegetation and Inclusion of Historically Deep Plowed Areas | DC: The shinnery oak species composition provides vegetation structure and height relationships necessary for ground-nesting bird cover and brood-rearing habitat for the Lesser Prairie-chicken and other ground nesting birds such as the Rio Grande Turkey and Northern Bobwhite. Small areas of short structured herbaceous vegetation or patches of bare ground are available for Lesser Prairie-chicken leks and courtship areas; these areas also provide wildlife travel corridors, escape routes and annual plant germination sites for wildlife foraging habitat. Trees are nonexistent and collision risks from fences, etc., are minimal in areas important for recovery of LPC. |
| 62 | Lesser Prairie-chicken | Shinnery Oak Vegetation and Inclusion of Historically Deep Plowed Areas | DC: Fire occurs on a 2- to 9-year cycle on the landscape at varying intervals and intensities determined by vegetative and climatic conditions. Ground cover provides soil stabilization and water infiltration and retains fire fuels. |
| 63 | Lesser Prairie-chicken | Shinnery Oak Vegetation and Inclusion of Historically Deep Plowed Areas | O: Within 10 years of plan approval, mark 25% to 50% of fences in suitable Lesser Prairie-chicken habitat to minimize collisions of the bird with fences. |
| 64 | Lesser Prairie-chicken | Shinnery Oak Vegetation and Inclusion | O: Use prescribed fire twice on 80% of the shinnery oak within 15 years of plan approval. |

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National Grasslands Biological Assessment

**Plan Components Numerical Code Resource/Species/Category Listing**

| Code # | Species | Resource Area | Plan Components Desired Condition (DC), Objective (O), Standard (S), and Guideline (G) |
|---|---|---|---|
| | | of Historically Deep Plowed Areas | |
| 65 | Lesser Prairie-chicken | Shinnery Oak Vegetation and Inclusion of Historically Deep Plowed Areas | O: Mechanically or chemically, remove 80-100% of undesirable trees in shinnery oak areas within 15 years of plan approval. |
| 66 | Lesser Prairie-chicken | Shinnery Oak Vegetation and Inclusion of Historically Deep Plowed Areas | G: Trees in upland settings within landscapes suitable for Lesser Prairie-chicken habitat should be targeted for eradication. |
| 67 | Lesser Prairie-chicken | Shinnery Oak Vegetation and Inclusion of Historically Deep Plowed Areas | G: Timing of prescribed fire should consider the adverse consequences to ground nesting birds. |
| **Kiowa Rita Blanca** | | | |
| 68 | Lesser Prairie-chicken | Sand Sagebrush | DC: Sand sagebrush vegetation is characterized by shrubs, grasses, and forb species with structure and composition across the landscape that maintain the reference condition and areal extent. Vegetation cover is generally comprised of 20 to 60 percent grasses, 2 to 15 percent forbs, > 15 percent shrubs, and a variable percentage of bare ground, dependent upon the site potentials of these areas. |
| 69 | Lesser Prairie-chicken | Sand Sagebrush | DC: The sand sagebrush species composition provides vegetation structure and height relationships necessary for ground-nesting bird cover and brood-rearing habitat. Small areas of short-structured herbaceous vegetation or patches of bare ground are present for Lesser Prairie-chicken leks and courtship areas. These patches also provide wildlife travel corridors, escape routes, and annual plant germination sites for wildlife foraging habitat. |
| 70 | Lesser Prairie-chicken | Sand Sagebrush | G: Management activities should be implemented that encourage forbs and cool season grasses. |
| 71 | Lesser Prairie-chicken | Sand Sagebrush | G: Pastures should be grazing only once during the growing season. |
| 72 | Lesser Prairie-chicken | Sand Sagebrush | G: Dormant season grazing should be emphasized to maximize ground cover. |
| 73 | Lesser Prairie-chicken | Sand Sagebrush | G: Timing of prescribed fire or other vegetation treatments should consider adverse consequences to nesting birds. |
| 74 | Lesser Prairie-chicken | Sand Sagebrush | G: Growing season rest should be provided following a burn event. |
| **Mills Canyon Management Area** | | | |
| 75 | Interior Least Tern and ARS | Dispersed Camping Recreation | O: Rehabilitate all user-created routes and closed roads that are causing resource concerns within 15 years after a Travel Management decision is signed for the Management Area. |
| 76 | Interior Least Tern and ARS | Dispersed Camping Recreation | O: Close or rehabilitate all unauthorized motorized vehicle stream crossings in the corridor within 10 years of plan approval. |
| 77 | Interior Least Tern and ARS | Dispersed Recreation | S: Manage the Canadian River to preserve its wild, scenic, or recreation river potential. |

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National Grasslands Biological Assessment

**Plan Components Numerical Code Resource/Species/Category Listing**

| Code # | Species | Resource Area | Plan Components<br>Desired Condition (DC), Objective (O), Standard (S), and Guideline (G) |
|---|---|---|---|
| 78 | Interior Least Tern and ARS | Canyon Lowlands and Canadian River Riparian | DC: The composition, structure, and function of vegetation promote resilience of the system to the frequency, extent, and severity of flood events. Vegetation is represented in a diverse composition and age class distribution. Species present within the 2 to 5-year floodplain indicate maintenance of riparian soil moisture characteristics. Vegetation within the secondary and tertiary floodplains is adequate to protect soils and dissipate energy during high flows. Early successional stage occurs post-flood and covers 10-20% of the floodplain. Mid to late development stages cover 50-80% of the floodplain in relative abundance, with a mixture of upland and riparian dependent species present. |

**United States Department of the Interior**

**U.S. FISH AND WILDLIFE SERVICE**
Ecological Services
P.O. Box 1306, Room 6034
Albuquerque, New Mexico 87103

In Reply Refer To:
FWS/R2/ES-TE/052396

Mr. Corbin L. Newman, Jr.
Regional Forester
U.S. Forest Service, Southwestern Region
333 Broadway SE
Albuquerque, NM 87102

Dear Mr. Newman:

Thank you for your correspondence received in our office on May 31, 2012. This letter documents our review of the Biological Assessment (BA) for the Kiowa, Rita Blanca, Black Kettle, and McClellan Creek National Grasslands Land and Resource Management Plan in compliance with section 7 of the Endangered Species Act (ESA) of 1973 (as amended (16 U.S.C. 1531 et seq.). The BA covers four grasslands located within Colfax, Harding, Mora, and Union Counties, New Mexico; Cimarron and Roger Mills Counties, Oklahoma; and Dallam, Gray, and Hemphill Counties, Texas.

Your letter, referencing the BA, is requesting concurrence with your determination that the proposed action "may affect, but is not likely to adversely affect" the endangered interior least tern (*Sterna antillarum*), threatened Arkansas River shiner (*Notropis girandi*) and its designated critical habitat. You are also requesting concurrence on a "no jeopardy/may affect not likely to adversely affect" determination for the lesser prairie chicken (*Tympanuchus pallidicintus*) (LPC), a candidate for listing. There is no requirement to consult on candidates under section 7 of the ESA, however, you have requested our concurrence with your determination of "may affect, but is not likely to adversely affect" the LPC in anticipation of a listing decision for this species; therefore, effects to that species will be considered in this document. We concur with your determinations and provide our rationale below. Additionally, you have made "no effect" determinations for the following species: southwestern willow flycatcher (*Empidonax traillii extimus*); black-footed ferret (*Mustela nigripes*), whooping crane (*Grus Americana*), Mexican spotted owl (*Strix occidentalis lucida*), and piping plover (*Charadrius melodus*). Species with "no effect" determinations do not require review from the U.S. Fish and Wildlife Service (Service), and are not addressed further.

Description of the Proposed Action

A complete description of the proposed action is found in your BA and the accompanying maps. The Cibola National Forest and Grasslands is using the guidance of the 2012 Planning Rule transition language allowing the provisions of the 1982 Planning Rule, including the requirement to prepare an

EIS, to complete the new plan for the grasslands. The management strategies for management of the grasslands provide a strategic, outcome-oriented, programmatic framework for future activities and will be implemented at the District level through the application of certain desired Conditions, objectives, standards, and guidelines.

Action Area

The area addressed by the Federal action described in your BA is the four Grasslands administered by the Cibola National Forest and National Grasslands and those adjacent lands that may be indirectly affected by the proposed action.

The Kiowa National Grassland (NG) in New Mexico, Rita Blanca National Grassland in Oklahoma and Texas Panhandle areas, Black Kettle National Grassland in Oklahoma and Texas, and McClellan Creek National Grassland in the Southeastern Panhandle of Texas have been under Federal ownership since the late 1930s and are currently administered by the Cibola National Forest and National Grasslands Supervisor's Office located in Albuquerque, New Mexico.

The Kiowa NG cover 137,537 acres and is located within Mora, Harding, Union, and Colfax Counties, New Mexico. The Rita Blanca NG covers 92,989 acres and is located within Dallam County, Texas, and Cimarron County, Oklahoma. The District ranger office for both the Kiowa NG and Rita Blanca NG is located in Clayton, New Mexico. The Black Kettle NG covers 31,286 acres and is located within Roger Mills County, Oklahoma, and Hemphill County, Texas. The McClellan Creek NG covers 1,449 acres and is located in Gray County, Texas. The District ranger office for both the Black Kettle and McClellan Creek NGs is located in Cheyenne, Oklahoma.

DETERMINATION OF EFFECTS

We concur with your determination that the proposed action "may affect, but is not likely to adversely affect" the interior least tern, threatened Arkansas River shiner and the lesser prairie-chicken for the reasons described below.

Interior least tern

The grasslands provide habitat for some species that are not directly related to vegetation types managed for within the Cibola National Forest. As stated in your BA, at full pool levels, there can be about 5,000 acres of aquatic lake habitat available for the least tern, a species known to forage the waters of some lakes managed by the Black Kettle and McClellan Creek NGs.

No interior least tern (tern) breeding occurs within the action area of any of the NGs. The nearest breeding area to a NG is along the South Canadian River, Texas, approximately eight miles north of the Black Kettle NG. There are about six breeding pairs of least terns in that area. Least terns use lakes on the Black Kettle NG, on Skipout, Dead Warrior, (previously known as Dead Indian) and Springcreek Lakes in Oklahoma and Lake Marvin and Lake McClellan in Texas for foraging, and are typically present from July until mid-September.

Due to the fact that no breeding habitat occurs on the grasslands and the species has only been seen foraging on the lakes within the Black Kettle and McClellan Creek NGs, the NGs have taken no specific recovery efforts for the tern. However, implementation of proposed plan components related to watershed conditions and grazing management should result in positive effects to the tern. Many of these plan components direct the NGs to manage preferentially for ESA listed species. In addition, many of the plan components are designed to improve the overall health and diversity of ecological conditions across the landscape. A list of these plan components along with a short summary of the effects analysis can be found on pages 24 and 25 of the BA.

The proposed plan provides a programmatic framework that guides site-specific actions but does not authorize, fund, or carry out any project or activity. Because the land management plan does not authorize or mandate any site-specific activities or ground-disturbing actions, there can be no direct effects. However, there may be implications or longer term environmental consequences of managing the grasslands under this programmatic framework. After the plan is implemented, all site-specific activities must conform to the programmatic framework set up in the proposed plan and they must meet site-specific National Environmental Protection Act (NEPA) and ESA requirements.

Based on the analysis of the plan components relating to the least tern, we concur that the implementation of the proposed plan "may affect but is not likely to adversely affect" the least tern for the following reasons:

1) Under the direction of the proposed plan there are no activities proposed to construct reservoirs or ponds on the Canadian River or its tributaries;
2) Plan Components promote protection and recovery of listed species;
3) While recreational activities on grassland lakes could disturb foraging terns during the summer months, the type and intensity of recreational activities suggests that these effects would be insignificant and discountable to the species; and
4) The proposed plan has standards for oil and gas leasing that controls surface use, and open pits are not allowed which could attract foraging least terns.

Lesser prairie-chicken

The lesser prairie-chicken (LPC) is managed as a Regional Forester's sensitive species and addressed in project specific NEPA documents as a result. Potentially suitable habitat for the LPC occurs on Kiowa, Rita Blanca, Black Kettle, and McClellan Creek NGs in Oklahoma, Texas and New Mexico in three primary vegetation types including shinnery oak, mixed-grass prairie and sand sagebrush.

*Mixed-grass prairie:* In 2011, no breeding populations of LPC occurred in the mixed-grass prairie on the Black Kettle, and McClellan Creek NGs, but they are known to occur in close proximity on adjacent or nearby private land. Habitat for the LPC is provided by the diverse structure and composition features of mixed-grass prairie. Tree encroachment on mixed-grass prairie has degraded the habitat for LPC by providing perches for predators such as hawks that prey on LPCs. In addition, utility transmission poles and tall structures from oil and gas sites also provide perches for birds of prey. About 88-94 percent (9,940−10,620 acres) of the mixed-grass prairie on the Black Kettle, and McClellan Creek NGs is suitable habitat for the LPC.

*Shinnery oak:* In 2011 no LPC breeding populations occurred in shinnery oak habitat on the Black Kettle and McClellan Creek NGs but they are known to occur in close proximity on adjacent private land. The LPC habitat is provided by the diverse structure and composition features of shinnery oak shrubland. Tree encroachment on shinnery oak vegetation has degraded LPC habitat by providing perches for predators such as hawks that prey on LPCs. In addition, utility transmission poles provide predator perches and roads fragment habitat as well. About 88–94 percent (16,630–17,770 acres) of the shinnery oak is suitable habitat.

*Sand sagebrush:* Currently, no LPC breeding populations occur in sand sagebrush on the Kiowa and Rita Blanca NGs, but the bird is believed to once have occurred in this habitat on the Kiowa and Rita Blanca NGs. Tall structures such as utility transmission poles degrade LPC habitat by providing perches for predators such as hawks that prey on LPCs. Sand sagebrush vegetation type has areas that were historically heavily plowed, and species structure and composition were altered to low vegetation. As of 2008 there were about 22,650 acres of suitable habitat for LPC in sand sagebrush on the Kiowa and Rita Blanca NGs.

Based on the analysis of the plan components relating to the LPC (Table five, page 39 of the BA), we concur that the implementation of the proposed plan "no jeopardy/may affect not likely to adversely affect" the LPC for the following reasons:

1) The proposed plan has components for resource areas that affect LPC over the life of the Plan;
2) The LPC is managed as a Regional Forester's sensitive species and addressed in project specific NEPA documents as a result;
3) Overall, the proposed plan includes plan components which, in general, are positive for the LPC. Many of these plan components direct the NG to manage preferentially for ESA listed species. Furthermore, many of the plan components are designed to improve the overall health and diversity of ecological conditions across the landscape.
4) In addition, specific plan components were developed for the LPC during plan development, including but not limited to equipping water sources with wildlife escape structures and targeting trees in upland settings within landscapes suitable for LPC habitat for eradication.
5) Current management as well as the 56 plan components described in Table five provide habitat necessary for the LPC. Although habitat fragmentation and structural intrusions limit occupancy of the NGs, the Districts are working to remove trees and other tall structural barriers to restore and maintain habitat for future occupancy.
6) Management direction for the NGs is likely to result in improved habitat conditions, minimization or elimination of the likelihood of incidental take, and supports the recovery of the LPC.

Arkansas River shiner and Critical Habitat

Historical records indicate that Arkansas River shiner (ARS) never resided in waters within the Kiowa, Rita Blanca, Black Kettle, and McClellan Creek NG boundaries and is not present currently. Historically and at present, the occupied reaches are downstream from these NGs. There is no

connectivity between occupied habitat and the Kiowa and Rita Blanca NGs due to Ute Dam and Optima Reservoir, which prevent upstream recruitment of the ARS to areas where NG activities may affect shiner populations. Kiowa NG is located 128.1 km (79.6 miles) upstream from the nearest occupied habitat in the Canadian River, which is downstream from Ute Dam. There is occupied habitat in the Beaver River below Optima Reservoir, located about 132.3 km (82.2 miles) downstream from Rita Blanca National Grassland which is outside the action area.

There is no occupied or suitable habitat within the Black Kettle National Grassland. However, the Texas portion of the Black Kettle National Grassland manages 218.5 ha (540 acres) of the Boggy Creek watershed (Lake Marvin), which drains into occupied habitat on the Canadian River, only 0.8 km (0.5 miles) downstream from the Black Kettle National Grassland boundary.

The Oklahoma portion of the Black Kettle National Grassland manages approximately 259 ha (640 acres) of headwaters in watersheds that drain into tributaries of the Canadian River as close as 3.4 km (2.1 miles) downstream from the grassland boundary.

Critical habitat

Critical habitat (CH) has not been designated within the four grasslands nor has it been designated for areas that could have indirect downstream effects from lands managed by Kiowa, Rita Blanca, Black Kettle, and McClellan Creek NGs. Even though CH has not been designated, riparian, wetland, wildlife and threatened and endangered species values and habitats are protected by plan components in the proposed plan.

In the BA, you make a "may affect and is not likely to adversely affect" determination for the CH for the ARS. We believe that ARS CH will not be affected by the proposed action.

In addition, we concur with your determination that the proposed plan will have a "may affect but is not likely to adversely affect" the ARS for the following reasons:

1) ARS does not occur within the grasslands;
2) The grasslands manage 1180 acres of headwaters of watersheds that drain into tributaries that are connected to occupied habitat; however, this is an insignificant amount of the hydrological basin that contributes to ARS habitat;
3) There are 26 plan components applicable to ARS, for example: achieving a desired condition that all natural aquatic habitats benefit and encourage populations of native species including the ARS; soil disturbing activities would be designed to prevent sediment into streams, lakes and/or wetlands; and designated motorized vehicle stream crossings will be maintained to provide for aquatic passage. These components in addition to the 23 others listed in Appendix A of the BA will benefit the species based on long term improvement and protection of habitat, including plan components that promote protection and recovery of listed species.

**CONSERVATION RECOMMENDATIONS**

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened

species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. As such, we recommend the following:

1. Update the Climate Change section to include information more specific to Oklahoma, Texas, and New Mexico.
2. Continue to improve and expand habitat for LPC including removal of black locust (*Robinia pseudoacacia*) from shinnery oak (*Quercus havardii*) landscapes within suitable habitats, as well as, other vertical structures that fragment habitat.
3. Continue to survey for the LPC within the grasslands of New Mexico, Oklahoma, and Texas.
4. Should the LPC be found within any of the NGs, reinitiation of consultation with the appropriate field office should occur to ensure that the appropriate conservation needs of the LPC are addressed.

We appreciate your willingness to work with the Service to protect proposed, listed, and candidate species and their habitats. If you have questions or comments, please contact Susan Jacobsen, Chief, Threatened and Endangered Species, Ecological Services, at 505-248-6641.

Sincerely,

Susan Jacobsen

Acting Assistant Regional Director
Ecological Services

cc: Field Supervisor, Oklahoma Ecological Services Field Office, Tulsa, OK
Field Supervisor, New Mexico Ecological Services Field Office, Albuquerque, NM
Field Supervisor, Arlington Ecological Services Field Office, Arlington, TX